EXPLOITING THE LAST OCEAN: THE EFFECTIVENESS OF THE CONVENTION ON THE CONSERVATION OF ANTARCTIC MARINE LIVING RESOURCES, 1982-2000

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Abstract

In the late 1990s the Antarctic Treaty System (ATS) and the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR) faced a shock caused by the illegal, unregulated, and unreported (IUU) fishing of marine resources in the Southern Ocean. This challenge has the potential to undermine the credibility of the ATS and it also reveals the extent of the threat posed to the ecosystem of the Southern Ocean by commercial exploitation without adequate scientific understanding.

Although the Patagonian toothfish faces commercial extinction, and despite the unsustainable incidental mortality inflicted on the seabirds of the Southern Ocean, the CCAMLR regime may be transformed by this shock into a more effective environmental regime. This will be demonstrated by an analysis relying on the use of regime theory to investigate the effectiveness of CCAMLR in responding to the IUU fishing problems. In developing the analysis of CCAMLR theory relating to epistemic communities and regime change will also be explored.

The background to the establishment of the ATS will be briefly covered. The development of CCAMLR will be assessed in two parts. The first part looks at the development of CCAMLR before IUU fishing became a serious problem. The second part is a close focus on the development of the IUU fishing problems and the reaction by CCAMLR and its member states. The thesis finds that while CCAMLR has experienced a phase of creative tension leading to improved effectiveness in the past, currently it is pushing the limits of rational use of marine living resources in the Southern Ocean.

Acknowledgments

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List of Abbreviations Used in the Thesis

Agreed Measures	Agreed Measures on Flora and Fauna
ASMA	Antarctic Specially Managed Area
ASOC	Antarctic and Southern Ocean Coalition
ASPA	Antarctic Specially Protected Area
ATCM	Antarctic Treaty Consultative Meeting
ATCP	Antarctic Treaty Consultative Party
ATP	Antarctic Treaty Party
ATS	Antarctic Treaty System
BAS	British Antarctic Survey
BIOMASS	Biological Investigation of Marine Antarctic Stocks and Systems
CCAMLR	Convention on the Conservation of Antarctic Marine Living Resources
CCAS	Convention on the Conservation of Antarctic Seals
CCSBT	Commission for the Conservation of Southern Bluefin Tuna
CDS	Catch Documentation Scheme
CEMP	CCAMLR Ecosystem Monitoring Program
CEP	Committee for Environmental Protection
CFP	Common Fishing Policy
CHM	Common Heritage of Mankind
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
COFI	FAO Committee on Fisheries
CRAMRA	Convention for the Regulation of Antarctic Mineral Resource Activities
DG	Directorate-General
EACS	Eastern Antarctic Coastal States
EC	European Community
EEC	European Economic Community
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EU	European Union
FAO	Food and Agricultural Organization of the United Nations

FFA	South Pacific Forum Fisheries Agency
FRG	Federal Republic of Germany
FV	Fishing Vessel
GCAS	Graduate Certificate in Antarctic Studies
GATT	General Agreement on Tariffs and Trade
GDR	German Democratic Republic
GNAI	Greatest Net Annual Increment
GYM	Generalised Yield Model
IAATO	International Association of Antarctic Tourist Operators
ICCAT	International Commission for the Conservation of Atlantic Tunas
ICJ	International Court of Justice
ICRW	The International Convention for the Regulation of Whaling
IGO	Inter-governmental Organisation
IGY	International Geophysics Year
IMALF	Incidental Mortality Associated with Longline Fishing
IOFC	Indian Ocean Fisheries Commission
IPOA	International Plan of Action
IWC	International Whaling Commission
IUCN	International Union for the Conservation of Nature and Natural Resources
IUU	Illegal, unregulated, or unreported (fishing)
KYM	Krill Yield Model
MARPOL	International Convention for the Prevention of Pollution from Ships
MPA	Marine Protected Area
MSY	Maximum Sustainable Yield
NAFO	Northwest Atlantic Fisheries Organisation
NCP	Non-consultative Party
NGO	Non-governmental Organisation
NIEO	New International Economic Order
SCAF	Standing Committee on Administration and Finance
SCAR	Scientific Committee on Antarctic Research
SCM	Special Consultative Meeting
SCOI	Standing Committee on Observation and Inspection

SCOR	Scientific Committee on Oceanic Research
SORS	Southern Ocean Rim States
SPA	Specially Protected Area
Spp.	Species
SSSI	Site of Special Scientific Interest
TAC	Total Allowable Catch
TEWG	Temporary Environmental Working Group
The Commission	The CCAMLR Commission
The Committee	The CCAMLR Scientific Committee
The Convention	CCAMLR
The Convention Area	CCAMLR Boundary
The Madrid Protocol	The Protocol on Environmental Protection to the Antarctic Treaty
TVE	Television Trust for the Environment
UK	United Kingdom
UN	United Nations
UNCED	United Nations Conference on the Environment and Development
UNCLOS	United Nations Convention on the Law of the Sea
UNEP	United Nations Environment Program
UNGA	United Nations General Assembly
UNIA	The UN Agreement for the Implementation of Provisions of the United Nations Convention on the Law of the Sea relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks
USA	United States of America
USSR	Union of Soviet Socialist Republics
VMS	Vessel Monitoring System
WG-EMM	Working Group on Ecosystem Monitoring and Management
WG-FSA	Working Group on Fish Stock Assessment
WG-IMALF	The ad hoc Working Group on Incidental Mortality Associated with Longline Fishing
WG-krill	Working Group on Krill
WTO	World Trade Organization
WWF	World Wild Fund for Nature (formerly World Wildlife Fund)

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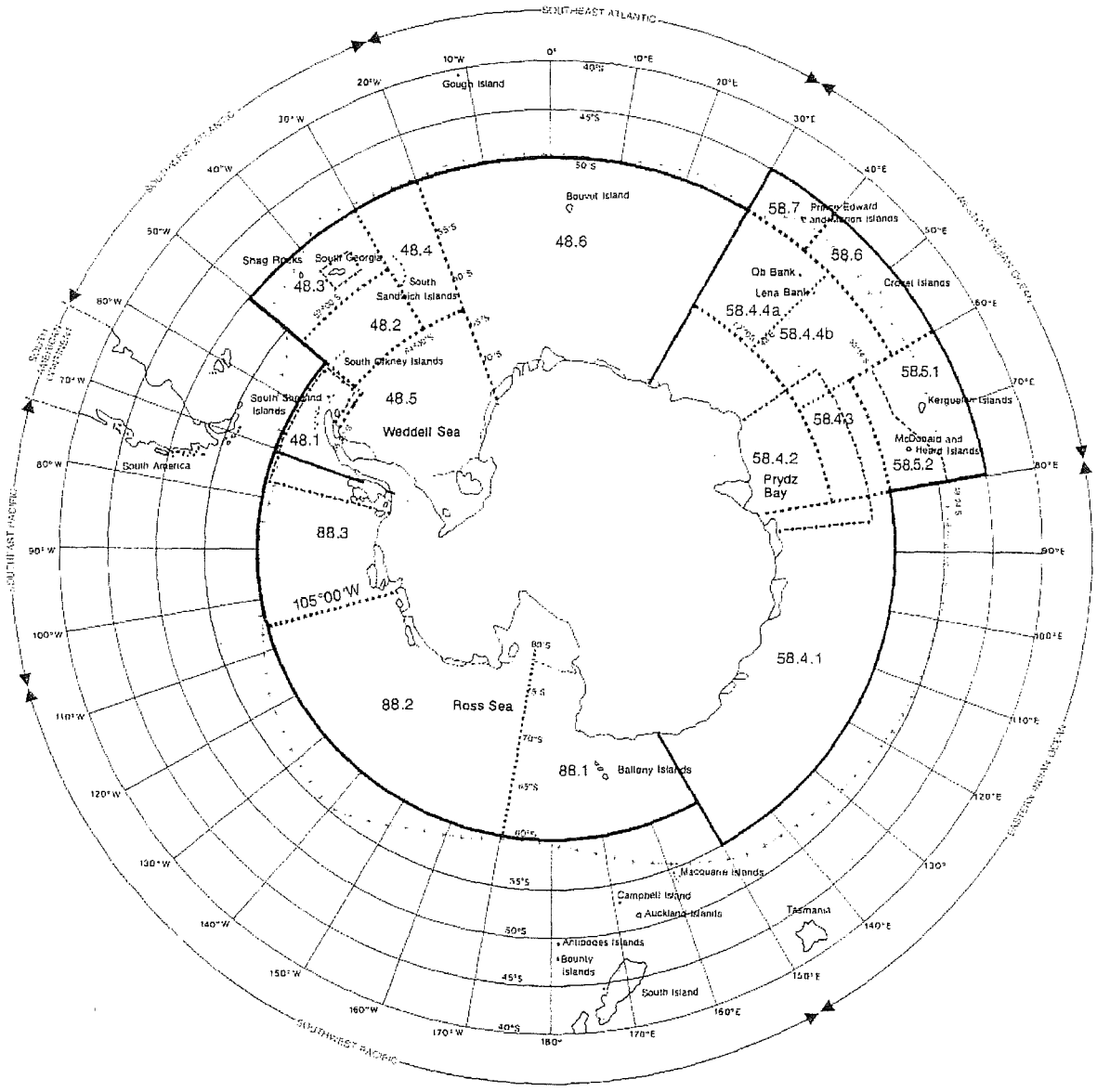
Map of the CCAMLR Convention Area[1]



LEGEND

STATISTICAL AREA
ZONE STATISTIQUE
СТАТИСТИЧЕСКИЙ РАЙОН
AREA ESTADISTICA

STATISTICAL SUBAREA
SOUS-ZONE STATISTIQUE
СТАТИСТИЧЕСКИЙ ПОДРАЙОН
SUBAREA ESTADISTICA

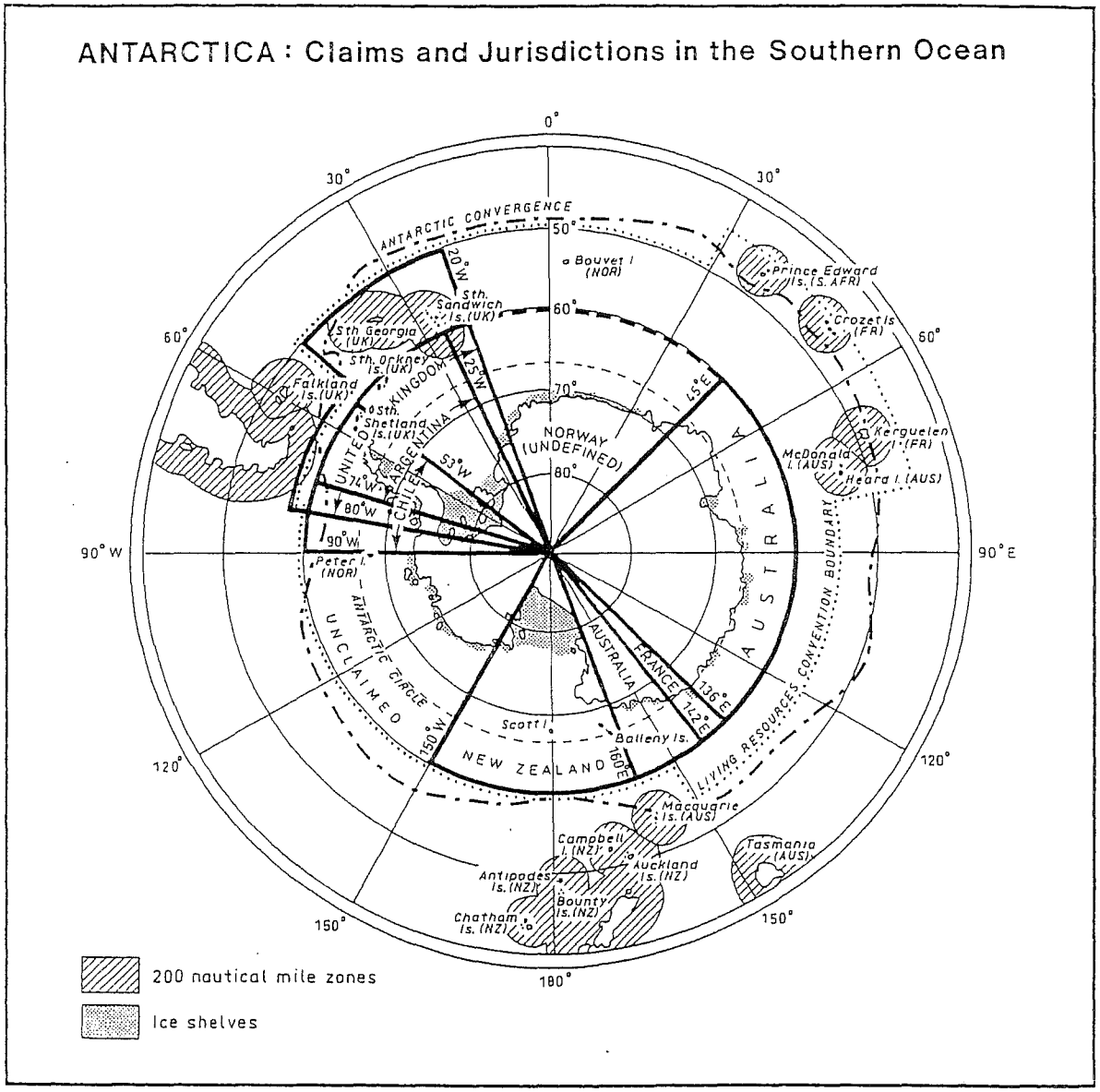
ANTARCTIC CONVERGENCE
CONVERGENCE ANTARCTIQUE
АНТАРКТИЧЕСКАЯ КОНВЕРГЕНЦИЯ
CONVERGENCIA ANTARTICA

CONTINENT, ISLAND
CONTINENT, ILE
МАТЕРИК, ОСТРОВ
CONTINENTE, ISLA

INTEGRATED STUDY REGION
ZONE D'ETUDE INTEGREE
РАЙОН КОМПЛЕКСНЫХ ИССЛЕДОВАНИЙ
REGION DE ESTUDIO INTEGRADO

[1] Boundaries of the statistical reporting areas in the Southern Ocean, from the CCAMLR webpage, http://www.ccamlr.org/English/e_conv/e_conv_area_map.htm, (site visited 9 January, 2002).

Map of Claims and Jurisdiction in the Southern Ocean[1]



[1] Christopher C. Joyner, *Governing the Frozen Commons: The Antarctic Regime and Environmental Protection*, University of South Carolina Press: Columbia, South Carolina, 1998, p.16. Used with the kind permission of the author.

CHAPTER 1

Introduction

In the late 1990s the Antarctic Treaty System (ATS) and the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR) faced a shock caused by the illegal, unregulated, and unreported (IUU) fishing of marine resources in the Southern Ocean. The challenge posed by this shock has the potential to undermine the credibility of the CCAMLR and ATS regimes as the source of governance authority for the Southern Ocean. It also reveals the extent of the threat posed to the ecosystem of the Southern Ocean by commercial exploitation without adequate scientific understanding of the potential impact of harvesting activities on that ecosystem. Although the Patagonian toothfish (*Dissostichus eleginoides*) faces commercial extinction, and despite the unsustainable incidental mortality inflicted on the seabirds of the Southern Ocean, CCAMLR may be transformed by this shock into a more effective international environmental regime, before other species, such as the Antarctic toothfish (*Dissostichus mawsoni*), are affected by overexploitation. This will be demonstrated by an analysis of the effectiveness of CCAMLR in responding to the IUU problems relying on the use of regime theory. If the CCAMLR regime is ineffective, then this has the potential to undermine the wider ATS regime within which it is embedded. If the CCAMLR regime is effective then the ATS regime should be strengthened.

The Antarctic continent and the surrounding Southern Ocean is the scene of efforts to find a balance among the different goals of commercial exploitation of resources, the preservation of the environment, and the continuing conduct of scientific research. This is carried out against a background of complex sovereignty issues and strategic interests, which have so far been largely resolved through cooperation and peaceful methods. One dramatic example of this was when the failure of all the Antarctic Treaty Consultative Parties (ATCPs) to ratify the Convention for the Regulation of Antarctic Mineral Resource Activities (CRAMRA), led to the Protocol on Environmental Protection to the Antarctic Treaty (hereafter the Madrid Protocol) in 1991. This fifty year moratorium on mineral activities in Antarctica resolved a major crisis within the ATS regime. The current shock does not present as dramatic a crisis, but it still demands attention.

Until the mid-1990s the CCAMLR regime, despite some criticism, was generally regarded as a fisheries regime with the potential to be effective. It had developed a system that promised to balance the environmental and exploitation goals of the regime, and the role that science played in the process had been clarified. When the Convention entered into force in 1982 no one predicted that CCAMLR, designed in large part to regulate krill fishing, would be faced with the problem of secretive, illegal and unregulated fishing in the Southern Ocean for a largely unheard of species, with the accompanying deaths of hundreds of thousands of seabirds, and the creation of an elaborate smuggling network to evade the need to comply with government regulations. The rise of IUU fishing in the Southern Ocean in the early 1990s has disrupted the ordinary routines of CCAMLR. Although the impact of IUU fishing on toothfish and the associated problem of incidental mortality of seabirds is of serious concern, this has been more of a political shock than a crisis. A political crisis similar to the CRAMRA situation would probably have been resolved within a few years with either a visibly changed or strengthened regime, or a sudden collapse of the regime. The shock posed by IUU fishing has now been sustained by CCAMLR for approximately six years. This has focused political attention, but if the problems are not adequately addressed in an effective and timely manner, then the CCAMLR regime could slide into a period of decline, or even decay into complete ineffectiveness. In assessing the effectiveness of CCAMLR it will be interesting to examine whether the shock has been absorbed and dealt with by change in the existing regime, or if a full crisis is developing that requires the creation of a new regime.

The definition of IUU fishing can be presented in several different formats, covering illegal, unregulated, unreported, and undermining or unauthorised fishing activities. Fishing is illegal when it occurs in the national jurisdiction of territorial waters or an Economic Exclusion Zone (EEZ) without being in accordance with a license or permit for fishing there. Fishing is considered to be unregulated when it occurs in the Convention Area without being in accordance with CCAMLR regulations, or if it is conducted in the high seas area on stocks that straddle the Convention Area. Fishing is undermining the Convention when it is carried out under flags of convenience, where the vessel is flagged to a third-party that is not a CCAMLR Member in a way that obstructs the purpose of CCAMLR. Illegal and unregulated fishing also tends to be unreported – which reduces the accuracy of available information to the CCAMLR Scientific Committee on the Southern

Ocean's fish and bird stocks and affects the ability for sound management by the CCAMLR Commission.

IUU fishing is a broad concept with some ambiguity, but in general IUU fishing is being conducted by 'bad actors' targeting high value species. David Balton defined the bad actors of ocean fisheries as "fishing vessel owners who do not observe agreed fishing rules (or EEZ fishing rules) and the flag States that fail to take action against them."[1] The IUU acronym appears to have originated in the late 1990s, possibly in Australia. A good actor by comparison, is a state, company, or individual that does play by the rules required to support a sustainable fishery. Bad actors tend to undermine good actors. They are a classic example of free riders in politics and of the problem which Garett Hardin called the tragedy of the commons.[2]

The scope of the IUU fishing problem on CCAMLR is found in three main areas. The first of these is the effect on the species directly targeted by IUU fishing:

> During 1997 the amount of illegal and unregulated fishing has far exceeded the global Total Allowable Catch (TAC), with consequent financial gains. If illegal and unregulated fishing continues at the current level the population of Patagonian toothfish will be so severely decimated that within the next 2 to 3 years the species will be commercially extinct. Some areas are already showing signs of this.[3]

The second area is the effect of incidental mortality on seabirds caught on longline hooks set by the IUU fishers. In 1998 the CCAMLR Commission noted:

> that estimates of seabird by-catch mortality from unregulated fishing in the Convention Area in 1998 (50 000 to 89 000 seabirds) are essentially similar to those of 1997 ... It noted further that these levels of by-catch are:
> (i) about two orders of magnitude greater than in the regulated fishery
> (ii) unsustainable for the albatross, giant petrel and white-chinned petrel populations concerned[4]

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[1] David Balton, "Dealing With the 'Bad Actors' of Ocean Fisheries", *Address at Conference on Fisheries Management, Norway Graduate School of Economics*, Bergen, Norway, May 20, 1999, http://www.state.gov/www/policy_remarks/1999/990520_balton_fisheries.html (site visited 11 October 2000).
[2] Garrett Hardin, "The Tragedy of the Commons", *Science*, 162, 1968, pp.1243-1248.
[3] 'Australia Welcomes Norwegian Government Action On Illegal Fishing', Joint Media Release Alexander Downer (Minister for Foreign Affairs) and Warwick Parer (Minister for Resources), http://www.dfat.gov.au/media/releases/foreign/1998/fa098_98.html (site visited on 22 November 2000).
[4] CCAMLR-XVII, 6.22, p.27.

Because the *Dissostichus* species (spp.) are a predator species relatively high up the food chain in the ecosystem of the Southern Ocean, there have been fewer effects on dependent species than might otherwise have been the case. The problem of incidental mortality can not be effectively addressed without addressing the problem of IUU fishing as well. In the third area of economics the *Dissostichus* spp. have commanded a high price in the international market. In 1997 Australia estimated the total wholesale value of the IUU catch of toothfish to be in the order of half a billion Australian dollars, and that it was likely that over 100 vessels were involved in the illegal fishing activities.[5] In addition at least thirty-three people have also died while engaged in harvesting activities directed towards *Dissostichus* spp. over the years from 1993-2000.[6]

Sources

The thesis research relies on a combination of primary and secondary sources. Primary sources include the various reports of the CCAMLR Commission and the CCAMLR Scientific Committee (hereafter referred to just as the Commission and the Scientific Committee respectively) from 1982 onwards.[7] Interviews with some of the New Zealand nationals present at CCAMLR negotiations in the late 1990s were carried out. Use has also been made of contemporary media articles, press releases, and informational bulletins from different governmental and non-governmental organisations. Secondary sources of books, and journal articles, have also been used extensively in elaborating accounts of Antarctic and ATS history, CCAMLR negotiations and development of CCAMLR. The focus has been on political and legal sources, not on the science of the issues, as this lies outside my expertise. In general I have accepted the summaries of the scientific approach as presented by CCAMLR.

I was privileged to be allowed to attend the meeting of CCAMLR in 1998 as an adviser attached to the New Zealand delegation. This afforded me the opportunity of attending the meetings of both the Scientific Committee and the Commission, as well as the Standing

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[5] CCAMLR-XVI, 5.31, p.12.
[6] Two crew died aboard the *Friosur V* in the 1993/94 Season in Area 48.3. CCAMLR-XIII, Annex 5, SCOI Report, 1.7, p.102. Seventeen crew died in the sinking of *Sudur Havid* 6 June 1998. CCAMLR-XVII, 2.23, p.4. Fourteen crew died in the sinking of the *Amur* 10 October 2000, (see n170 chapter 5, p.183).
[7] The reports of the Commission are given in the abbreviated style CCAMLR-(meeting number), paragraph, page, and the Scientific Committee's reports are abbreviated to SC-CAMLR-(meeting number), paragraph, page.

Committee on Administration and Finance (SCAF) and the Standing Committee for Observation and Inspection (SCOI). This gave me access to otherwise unobtainable draft documents and the opportunity to meet and discuss the problems of CCAMLR with delegates from around the world. This opportunity was limited by my own inexperience with conference diplomacy, and a confidentiality agreement that restricted my use of some knowledge gained from the meeting where I have been unable to confirm a point through public sources. Sources for the most recent CCAMLR meeting in 2000 are still limited as the final versions of the reports of the various CCAMLR committees are unlikely to be publicly available before mid-2001.

Structure of the Thesis

After this introduction the second chapter of this thesis will concentrate on regime theory with a view to treating CCAMLR and the ATS as regimes. This starts with an overview of the basic definitions of regime theory, and how they can be applied to the ATS and CCAMLR. The different schools of thought in regime theory are presented, followed by expanding on the concept of effectiveness and how it relates to regimes. Gaps in the current scholarship of regime theory are identified and the methodology for the analysis of the case study of CCAMLR is presented. The thesis will concentrate on the factors related to regime effectiveness, the concept of an epistemic community and theory related to regime change.

The third chapter will cover the general background of the geography and history of Antarctica and the Southern Ocean, leading into a more focused study of the development of the ATS and the legal background for current issues, especially issues related to sovereignty. This will be followed with an overview of global environmental macro-trends that impact on the Southern Ocean, and some background on previous exploitation of the marine environment of the Southern Ocean.

The fourth chapter will start to cover the detail of the case study, with an examination of the historical development of the CCAMLR regime. This examines the basic structure of participation and decision-making in the regime and how this affected the development of the role of scientific advice, conservation measures, and the system of observation and inspection. An assessment of the effectiveness of CCAMLR in its early period will be

made. It will be argued that after a period of ineffective tension, the CCAMLR regime developed into a potentially effective regime.

The fifth chapter will cover the development of the IUU problem in the Southern Ocean and the response from CCAMLR. The new fisheries developed under CCAMLR management are discussed. Then the rise of IUU fishing is covered and the response by CCAMLR is examined in close detail, followed by a similar treatment of the related problem of incidental mortality. Some of the obstacles to effective conservation measures are then analysed before an initial assessment of the effectiveness of CCAMLR in dealing with the IUU problem is made. The argument is made that CCAMLR is pressing the limits of the concept of rational use contained within its conservation objectives.

The sixth chapter will use regime theory in an attempt to analyse the effectiveness of the CCAMLR regime in its response to the IUU fishing problems. The areas of interest outlined in chapter two will be applied to the case study material presented in chapters three to five. The aim is to try and consolidate and refine regime theory relating to the effectiveness of regimes, with a particular interest in the areas of epistemic communities and regime change. Conservation measures implemented by CCAMLR and counterfactual arguments about the CCAMLR regime will be examined. An attempt will be made to identify the epistemic communities associated with the CCAMLR regime, tracing their activities and demonstrating their influence and impact in relation to the IUU fishing problems.

In the seventh and final chapter the conclusions of the thesis will be presented. The IUU problems are a hard case for CCAMLR that demonstrate that the regime does matter. Important changes that have happened to CCAMLR and the ATS will be assessed and a statement made about how effective CCAMLR and the ATS have been. Possible solutions to the IUU problems and policy recommendations will be outlined in the light of the potential scenarios for future progression of the problems. The contribution of this thesis to regime theory will be presented by accounting for the importance of the various factors of effectiveness. I will attempt to expand and refine theory as it relates to regime change, and to see whether the case study has confirmed or undermined the epistemic community concept. Areas for future research will be discussed.

CHAPTER 2

Regime Theory and CCAMLR: Governance Without Government

This chapter will attempt to give an overview of regime theory in three parts. The first part will outline the basic definitions of regime theory, which will be applied to the ATS and CCAMLR regimes. The second part deals with the development of regime theory, its history and main schools of thought. The third part is a critique of regime theory and the gaps in current scholarship. The three areas of focus for use in later analysis relate to effectiveness, epistemic communities, and regime change. The fourth part of the chapter deals with the methodology that will be used to analyse the case study in chapter 6.

Definitions – What is an International Regime?

It is important both to define international regimes, and to distinguish between different types of regimes.[1] What is, and is not, a regime? The consensus definition of international regimes developed by Krasner is:

> International regimes are defined as principles, norms, rules, and decision-making procedures around which actor expectations converge in a given issue-area. Principles are beliefs of fact, causation, and rectitude. Norms are standards of behavior defined in terms of rights and obligations. Rules are specific prescriptions or proscriptions for action. Decision-making procedures are prevailing practices for making and implementing collective choice.[2]

Regimes are usually treated as intervening variables between basic causal factors, the outcomes achieved, and the behaviours demonstrated by the actors involved. Some of the basic causal factors are: power, interest, values, and knowledge. A regime is a form of governance system in an issue area.[3]

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[1] Marc A. Levy, Oran R. Young, and Michael Zürn, "The Study of International Regimes", *European Journal of International Relations*, 1 (3), 1995, p.269.
[2] Stephen D. Krasner, *International Regimes*, Cornell University Press: Ithaca, 1983, p.1.
[3] Oran R. Young, *International Governance: Protecting the Environment in a Stateless Society*, Cornell University Press: Ithaca, 1994, p.26.

International regimes are a special case of international institutions or organisations.[4] This is because in most cases "all international organizations are characterized as regimes, but not all regimes are viewed as international organizations."[5] The existence of an international organisation implies an explicit, formal regime, with a bureaucracy or charter. This is a narrow and legalistic view, but a wider definition would be less precise. Regimes tend to be restricted to one issue area, while an institutional organisation such as the UN may be involved in many different issue areas. The "most salient difference between regimes and organizations is that regimes – being sets of principles, norms, rules, and procedures – do not possess the capacity to act".[6] In this respect the ATCPs have in the past retained the power to act in the area covered by Antarctic Treaty, rather than delegating it to any institution.

Criticism of the consensus definition has been made on grounds that its components are indistinguishable and vague. There is broad agreement on treating regimes as social institutions and on characterising regimes as issue-area specific.[7] The difficulty lies in developing a formal conceptualisation of what makes up an international regime. Various neologisms have also been coined, such as 'policy coordination' or 'governance system', but regime remains the most common term in use to describe the mechanisms that states use to solve problems in international governance. As Helen Milner observed: "Defining a regime remains a difficult task; one could say that despite the consensus definition proposed by Krasner a decade ago, the concept is still essentially contested."[8]

The Antarctic Treaty System regime

Christopher Joyner writes that "The normative rights and duties, rules and procedures laid out in the Antarctic Treaty and associated agreements combine to constitute an Antarctic regime."[9] The term 'system' gradually became an adjunct to the name of the Antarctic

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[4] The terms institution and organisation appear to be interchangeable.
[5] Helen Milner, "International Regimes and World Politics: Comments on the articles by Smouts, de Senarclens and Jönsson", *International Social Science Journal*, 138, 1993, p.494.
[6] Andreas Hasenclever, Peter Mayer, and Volker Rittberger, "Interest, Power, Knowledge: The Study of International Regimes", *Mershon International Studies Review*, 40, 1996, p.179.
[7] Marc A. Levy, Oran R. Young, and Michael Zürn, op. cit., p.270.
[8] Helen Milner, op. cit., pp.493-4.
[9] Christopher C. Joyner, *Governing the Frozen Commons: The Antarctic Regime and Environmental Protection*, University of South Carolina Press: Columbia, South Carolina, 1998, p.96. A different angle is taken in Davor Vidas, "The Antarctic Treaty System in the International Community: an Overview" in Olav Schram Stokke, and Davor Vidas (eds), *Governing the Antarctic: the Effectiveness and Legitimacy of the*

Treaty and was codified in 1979.[10] The Antarctic Treaty is the core of a network of regimes that are linked to the parent regime and each other, forming an ATS regime. Various terms have been used to describe the relationship between the ATS as a whole and its various parts. The individual regimes have been variously described as 'embedded', 'nested', or 'cradled sub-regimes'[11] within the wider ATS regime. The Antarctic Treaty is the parent regime because it was the first regime, and the associated sub-regimes all originated from decisions made within the Antarctic Treaty regime. This 'grand regime' shares many common goals, principles, norms, rules, and decision-making procedures, although differences do exist between the different sub-regimes. This creates what Joyner called the "Antarctic normscape for ATCP governments."[12]

Regimes require at least one issue area that acts as a focus for the regime. The different sub-regimes of the ATS regime can be considered as regimes in their own right because they are focused on different issue areas. So CCAMLR is the regime dealing with the issue of living resource management in the Southern Ocean, the Convention for the Conservation of Antarctic Seals (CCAS) is the regime dealing with the issue of sealing, and the Madrid Protocol is the regime dealing with the issue of environmental protection in Antarctica. Issue areas need to be defined spatially and in terms of activity as they can expand or contract over time. One emergent issue area is the question of how to regulate and control tourism activities in Antarctica and the Southern Ocean. So far this issue is being handled by the ATCPs without the creation of a new regime.

As these regimes are all part of the same system, a change in the credibility or effectiveness of one regime can strengthen or undermine the system as a whole. The sub-regimes are subordinated to the Antarctic Treaty, but the level of dependence on the Antarctic Treaty varies between the sub-regimes. CCAMLR meets separately from the Antarctic Treaty Consultative Meeting (ATCM), unlike the Madrid Protocol's Committee for Environmental Protection (CEP) which meets at the same as the ATCM. Although CCAMLR has principles, norms, rules, and decision-making procedures in common with

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Antarctic Treaty System, Cambridge University Press: Cambridge, 1996, pp.39-40. Vidas compares the usage of the term 'system' to the conceptualisation of international law as a system.

[10] The first reference to the Antarctic Treaty system appears to be in Recommendation X-1 on Antarctic Mineral Resources, Antarctic Treaty, *Report of the Tenth Consultative Meeting, Washington, D.C., September 17-October 5, 1979*, Department of State: Washington D.C., 1979.

[11] Christopher C. Joyner, op. cit., p.101.

[12] ibid., p.102.

the Antarctic Treaty regime, its main linkages to the ATCPs are either informational or through common membership. The CCAMLR Executive Secretary reports to the ATCM on CCAMLR activities, and reports relevant ATCM decisions back to meetings of the Commission. An observer from SCAR sometimes attends meetings of the Scientific Committee, and a CCAMLR observer can attend SCAR meetings. Membership is one source of linkage between the different ATS regimes, as many, but not all, members of the Antarctic Treaty regime are also members of the different sub-regimes. The ATCPs are reluctant to try and direct CCAMLR through the ATCM and its recommendations, and have restricted themselves to resolutions.[13] Considerable overlap still exists between the different regimes as business may be dealt with by more than one regime. For example, the concept of a making the Balleny Islands a protected area has been discussed for three years at meetings of both CCAMLR, and CEP.[14]

The ATS regime is also influenced by external regimes. These are regimes which have not originated from the Antarctic Treaty regime, and the membership of these regimes often includes actors who are not associated with the ATS regime. Linkages between external regimes and the ATS regime are often indirect, relaying on the state actors to coordinate information. The figure on the following page is one attempt at illustrating the linkages between the different components of the ATS regime, and eleven of the external regimes which exercise some influence on activities in the area covered by the ATS regime.[15] The CRAMRA regime has been included, despite it currently being in limbo.

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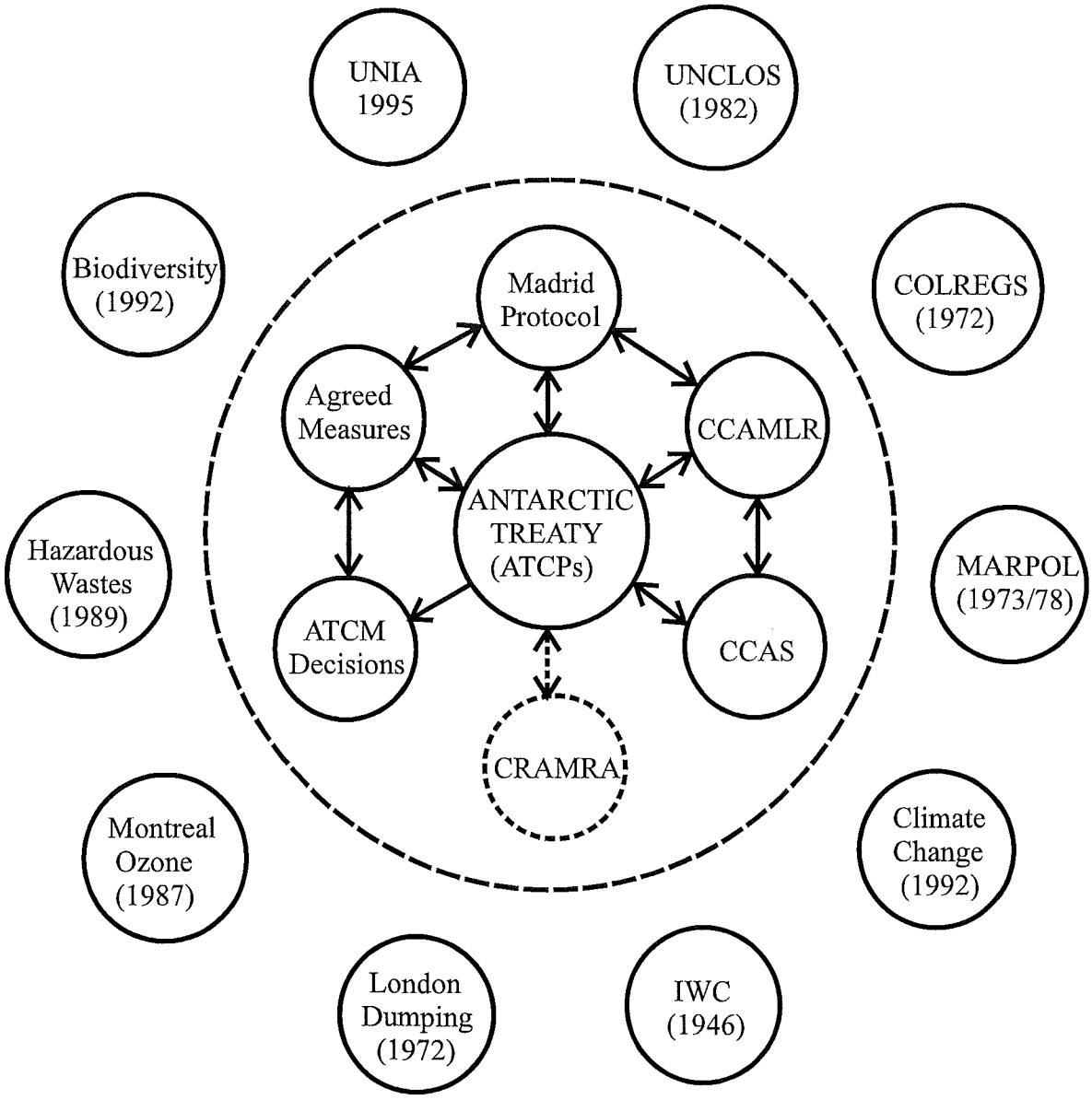
[13] Three resolutions supporting the introduction and implementation of a catch documentation scheme by CCAMLR have been made by the ATCPs during 1999-2001. ATCM XXIII Resolution (3), SCM XII Resolution (2), and ATCM XXIV Resolution (1).

[14] New Zealand, *The Balleny Islands Aide Memoire*, IP09, XXIV Antarctic Treaty Consultative Meeting, 2001, http://www.ln.mid.ru/website/24atcmin.nsf/information?OpenView, (site visited January 10, 2002).

[15] These external regimes include: the 1982 United Nations Convention on the Law of the Sea (UNCLOS), the 1973 International Convention for the Prevention of Pollution from Ships (MARPOL), the 1972 Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (the London Dumping Convention), the 1972 Convention on the International Regulations for Preventing Collisions at Sea (COLREGS), the 1946 Convention for the Regulation of Whaling (IWC), the 1992 UN Framework on Climate Change, the Convention on Biological Diversity, the 1985 Convention for the Protection of the Ozone Layer and its 1987 Montreal Protocol, the 1995 UN Agreement for the Implementation of Provisions of the United Nations Convention of the Law of the Sea relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (UNIA) and the 1989 Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal.

Figure 1[16]

The Antarctic Treaty System Regime



Principles in the ATS regime

The concept of values is important because it underlies the origins of the principles and norms used by a regime, which in turn generate the rules and procedures of that regime. A value is esteemed by states, or other actors, for its own sake.[17] A value represents an objective to be achieved. Values may derive generally from the international system, or they may be specific to a given issue area. The preservation of the Antarctic continent in a pristine condition is something that is of value to some actors, because this will preserve

[16] This figure is based on a figure originally found in Christopher C. Joyner, op. cit., p.97. Joyner includes the external regimes in what he terms the Antarctic Regime for simplicity.

[17] ibid., p.85.

the usefulness of the continent as a scientific laboratory. Other actors might value the preservation of the continent on aesthetic grounds. Different values can be ordered in a hierarchy of values. This hierarchy will determine the priorities that actors will use to choose between different principles, norms, rules, and procedures when there is a conflict between them.

The consensual definition for regimes holds that "Principles are beliefs of fact, causation, and rectitude."[18] These principles can be explicit or implicit and "involve goal orientations and causal beliefs cast at the level of general policy arenas."[19] Several key principles can be found in the ATS regime, although there are some differences of opinion as to what these principles are, and some specific principles apply only to the CCAMLR regime. The Antarctic Treaty reflected three fundamental principles for establishing cooperation and avoiding conflict in the Antarctic: the value of the compromise on sovereignty, the importance of avoiding conflict in Antarctica, and cooperation for scientific research. The original commitment to environmental protection was limited to a single reference in the Antarctic Treaty.[20] Davor Vidas offers a different listing of principles, with the protection of the environment as one of three principles of the Antarctic Treaty and the preservation of the freeze on the sovereignty issue as a value goal common to all of the principles.[21]

Principles relating to economic exploitation were left to be developed later with the negotiation of the CCAMLR and CRAMRA regimes. While the CCAMLR regime was successfully negotiated and entered into force, the CRAMRA regime has not entered into force as a result of the increasing value attached to the goal of environmental protection.[22] The advent of the Madrid Protocol marked the rise of environmental protection as a value that is now fundamental to the planning and conduct of all activities in Antarctica, and this value is represented in the more rigorous and extensive principles of the Madrid Protocol.[23] Developing these principles into new rules and decision-making procedures has been more difficult, with the liability annex still under negotiation nine years later.

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[18] Stephen D. Krasner, op. cit.
[19] Marc A. Levy, Oran R. Young, and Michael Zürn, op. cit., p.273.
[20] Appendix I, Article IX (1) (f).
[21] Davor Vidas, "The Antarctic Treaty System in the International Community: an Overview" in Olav Schram Stokke, and Davor Vidas (eds), *Governing the Antarctic: the Effectiveness and Legitimacy of the Antarctic Treaty System*, Cambridge University Press: Cambridge, 1996, pp.44-45.
[22] See Chapter 3, pp.77-78.
[23] Lorraine M. Elliott, *International Environmental Politics: Protecting the Antarctic*, St. Martin's Press, Inc: New York, 1994, p.196.

The principles of the CCAMLR regime are derived from when the actors involved with the ATS regime had a different hierarchy of values. Conservation values were important but a value was attached to economic exploitation that displaced environmental protection as a primary goal of CCAMLR. The principles used in negotiating CCAMLR were that Consultative parties were to retain prime responsibility for the protection and conservation of the environment, the provisions of Antarctic Treaty Article IV on territorial claims were not to be affected, and that the regime boundary could extend north further than 60° South latitude to ensure effective conservation of species in the Southern Ocean ecosystem.[24]

Environmental principles were first articulated for the ATS in 1970, but they have not always been well implemented in practice by CCAMLR.[25] The CCAMLR ecosystem approach is based on the principles found in Article II of the Convention.[26] These require *inter alia* that irreversible changes should not be made to the marine ecosystem, depleted stocks must be restored, and harvesting should undermine future stable recruitment levels. These principles reflect the interests of the ATCPs that wanted to engage in fishing activities, with the definition of conservation in Article II including 'rational use' of the resource. CCAMLR also tries to uphold a 'precautionary approach' that relies on taking a conservative approach to management when information is lacking.[27] The tension between the principles of exploitation and conservation means that CCAMLR has been considered a flawed instrument for ensuring environmental conservation.[28]

Norms in the ATS regime

The consensus definition for norms holds that "Norms are standards of behavior defined in terms of rights and obligations."[29] Norms are important, and ubiquitous, but hard to measure.[30] They are expected by participants within a regime issue area, and prescribe the desirable social goals and acceptable policy means for achieving them.[31] Interpretations of

[24] ibid., p.89.
[25] ibid., pp.63-64.
[26] Appendix II, Article II (3).
[27] The development of the precautionary principle is addressed in more detail in Chapter 4, pp.137-141.
[28] Lorraine M. Elliott, op. cit., p.97
[29] Stephen D. Krasner, op. cit.
[30] For a recent treatment of the history of the study of norms see Gregory A. Raymond, "Problems and Prospects in the Study of International Norms", *Mershon International Studies Review*, 41, 1997, pp.205-245.
[31] Christopher C. Joyner, op. cit., p.86.

the norms present within the ATS regime vary, and there is some overlap between norms and principles. For the actors involved in Antarctica some of the norms included: only peaceful use of the continent, non-nuclearisation of the region, peaceful settlement of disputes, conservation and protection of the circumpolar environment.[32] Norms can be made explicit in formal rules, or may be implicit in informal understandings. Norms, like rules, can be both proscriptive and prescriptive.[33] The effects of socialisation leads governments to comply with regime norms and this affects compliance with the rules of each regime.[34] Violations of norms can have a trip-wire effect, causing the mobilisation of a collective response.[35]

Lorraine Elliott identified ATS norms as being either sovereignty or interdependence norms. Sovereignty norms tend to favour the short term interests of states, while interdependence norms favour the construction of a regime.[36] Adherence to sovereignty norms makes it more difficult to have the monitoring and compliance rules required for effective international environmental protection because "governments will still seek to maintain as much control as possible over important decision-making processes".[37] Some commitment to interdependence norms was required in order for the Antarctic Treaty regime to be established. Effective management of international environmental problems may require more flexible attitudes to traditional conceptions of sovereignty if monitoring and compliance mechanisms are to be effective. In the past the hierarchy of values in the ATS regime has favoured sovereignty norms. Political and security concerns were placed before economic and environmental concerns.[38] The CCAMLR regime was established in an era when sovereignty norms still dominated the Antarctic 'normscape' and its compliance rules and decision-making procedures reflect this.[39] The approach of the Convention to sovereignty issues reinforced the deliberate ambiguity of the Antarctic Treaty. The Madrid Protocol represented a re-ordering of the hierarchy of values within the ATS regime.[40] The ATS regime is now more influenced by interdependence norms; although the sovereignty norms are still important.

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[32] ibid.
[33] ibid., p.102.
[34] ibid., p.103.
[35] Gregory A. Raymond, op. cit., p.215.
[36] Lorraine M. Elliott, op. cit., p.11.
[37] ibid. See Chapter 2, p.53 for treatment of the difference between formal and operational sovereignty.
[38] ibid., p.36.
[39] ibid., p.83.
[40] ibid., p.196.

In the past, the ATS regime has operated with a norm of institutional decentralisation. The ATCM rotates between ATCPs in alphabetical order, with each host providing the secretarial work required for that year. Apart from CCAMLR, few institutions were successfully created. Because of this there are no centralised or independent monitoring, enforcement, or inspection provisions in the ATS regime. This undermines the effectiveness of any commitment to environmental protection. The Madrid Protocol could lead to limited centralisation if the political will of the ATCPs supports the CEP institution.[41] While there is a general consensus on the need for an Antarctic Treaty secretariat, there is still an ongoing debate over the potential location for the secretariat. While Buenos Aires is a leading contender; the United Kingdom (UK) has not supported this, and Christchurch or Hobart have also been considered.[42]

Rules in the ATS regime

The consensual definition for rules holds that they "are specific prescriptions or proscriptions for action."[43] Rules are often a formalisation of the norms and principles, and can provide a framework for the decision-making procedures of the regime. These rules are "often stated explicitly in the formal agreements on which regimes are commonly based, and they facilitate assessments of implementation and compliance."[44] Although rules are usually stated in a formal format, they can be represented by informal practices as well.[45] Rules are an important characteristic of regimes because if the rules are not being adhered to then the strength and stability of the regime can be compromised.[46] Lack of compliance with existing CCAMLR rules is a key problem in the IUU fishing issue. Rules can be changed in order to improve the effectiveness of a regime.

The rules of the ATS regime are laid out in the Antarctic agreements or in ATCM recommendations. Some of the important ATS regime rules relate to compliance and enforcement mechanisms, although in the decentralised ATS system these provisions are

[41] ibid., p.200. This seems to be the case to date. Despite the lengthy period of time before ratification of the Madrid Protocol the ATCPs established a Temporary Environmental Working Group (TEWG) to start work in the area required by CEP.
[42] In 2001 consensus was finally achieved on this issue at ATCM XXIV and the Antarctic Treaty secretariat will be based in Buenos Aires. *Report of the XXIV Antarctic Treaty Consultative Meeting*, St. Petersburg, Russian Federation, 9 – 20 July 2001, sections 20-24.
[43] Stephen D. Krasner, op. cit.
[44] Marc A. Levy, Oran R. Young, and Michael Zürn, op. cit., p.273.
[45] Christopher C. Joyner, op. cit.

weak. There are prohibitions against military activities, a ban on nuclear explosions and disposal of radioactive waste in the region, a prohibition on mining, and regulations governing fishing.[47] These rules support the principles and norms of the regime. The rules for the CCAMLR regime are laid out in the Convention or in the conservation measures later adopted by the CCAMLR commission. One of the reasons for adopting separate conventions is that the rules in the new convention would be legally binding, and therefore stronger than ATCM recommendations.[48]

Decision-making procedures in the ATS regime

According to the consensus definition "Decision-making procedures are prevailing practices for making and implementing collective choice."[49] These decision-making procedures can be codified in a formal set of rules, such as the Rules of Procedure drawn up before the first ATCM.[50] Procedures lay out how the rules of the regime will be determined or modified in the future. Informal decision-making procedures can also occur, such as negotiations that may take place informally in the margins of meetings. Collective decision-making is part of the structure of regimes.[51] The key element of decision-making in the ATS regime is that it requires consensus. This exerts great influence on the implementation of rules, and how changes to its norms and principles can be made.

Policy making in Antarctica generally revolves around ATCMs and the various institutional arrangements made by new treaty instruments, such as the Seals Commission, CCAMLR Commission and its Scientific Committee, and the Madrid Protocol's CEP.[52] Special Consultative Meetings (SCM) are sometimes convened by the ATCPs to discuss subjects such as applications for consultative status, and negotiations for new agreements.[53] Meetings of experts can lead to reports that may form the basis for proposing recommendations at ATCMs. Less formal meetings, such as intersessional work on

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[46] Lorraine M. Elliott, op. cit., p.13.
[47] Christopher C. Joyner, op. cit., pp.86-87.
[48] Lorraine M. Elliott, op. cit., p.82.
[49] Stephen D. Krasner, op. cit., p.2.
[50] Lorraine M. Elliott, op. cit., p.39.
[51] Olav Schram Stokke and Davor Vidas, "Effectiveness and Legitimacy of International Regimes", in Stokke, Olav Schram, and Davor Vidas (eds), *Governing the Antarctic: the Effectiveness and Legitimacy of the Antarctic Treaty System*, Cambridge University Press: Cambridge, 1996. p.14.
[52] Christopher C. Joyner, op. cit., p.87.
[53] ibid., p.93. In 2000 an SCM was held in the Netherlands rather than an ATCM because the original host country, Poland, was unable to host the ATCM.

specific issues, can also lead to policy change in the ATS regime. The reliance on annual meetings for major decision-making can make for slow progress on issues that are developing quickly. This is something that might change if a secretariat for the Antarctic Treaty can be implemented with some degree of institutional authority.[54]

Decisions on matters of substance in the ATS regime are arrived at by using a consensus procedure. This derives from Article IX (4) of the Antarctic Treaty and was elaborated on in the rules of procedure before the first ATCM. A modification to the Antarctic Treaty can only occur by majority if there is a review conference,[55] and the Madrid Protocol also contains some majority decision provisions. The consensus rule is extremely important to the ATS regime and has a significant effect on both the legitimacy of the regime and its effectiveness. The legitimacy of the regime is enhanced among the state actors because the consensus rule gives the ATCPs what amounts to an effective veto over any proposed ATCM recommendation, allowing individual states to maintain favoured status quo provisions. The effectiveness of the ATS regime may be compromised however, because the consensus system allows change to be blocked.

CCAMLR reflects the ATS regime and Article XII of the Convention requires that all decisions on matters of substance are to be made by consensus, although other decisions can be made by a simple majority. This made the consensus procedure more explicit than it had been in the Antarctic Treaty. CCAMLR Article IX (6) (c) also allows any member to notify the commission within ninety days of the adoption of a conservation measure that it will not bind them. This allows members to 'opt-out' of conservation measures and entrenches a double veto. Consensus based decision-making systems mean that only the lowest common denominator proposal, or the 'least ambitious program' are likely to be adopted. There was some minor modification of the consensus rule in the Madrid Protocol. Amendments to the annex become binding after one year unless a time extension is applied for. This can only delay not prevent amendments from becoming legally binding.[56] More recently created environmental regimes have tended towards majority-rule based decision-making procedures.

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[54] A more detailed description of the CCAMLR decision-making process is given in Chapter 4, pp.122-127.
[55] Appendix I, Article XII (2) (b).
[56] Lorraine M. Elliott, op. cit, p.198.

Actors in the ATS regime

The main actors in the ATS regime can be divided into two main categories, state actors and non-state actors, which can be further sub-divided. There is a two-tier system of membership for state actors. Only the ATCPs have decision-making authority. The non-consultative parties (NCPs) have no formal decision-making role, although because they now have a right of attendance at ATCMs they can exercise a degree of influence on decision-making. The ATCPs are further divided between the original signatories, and the later ATCPs – who must continue performing scientific research in Antarctica to retain their ATCP status. Membership of CCAMLR is divided in a manner similar to the Antarctic Treaty. Some states are third parties to the ATS regime, and they are only able to exert influence indirectly, such as Malaysia did by raising the question of Antarctica at the UN. Membership of the various sub-regimes of the ATS regime is not uniform among parties to the Antarctic Treaty.

Traditional studies in international relations focus on the state actors, but non-state actors can also influence regimes and be influenced by them. The non-state actors can be divided into four main groups: the scientific community, international organisations, commercial operators, and the non-governmental environmental and conservation organisations (NGOs). Some of these actors operate more closely with the ATS regime than others, for example the International Association of Antarctic Tourist Operators (IAATO) is an observer at ATCMs, while fishing operators involved in IUU fishing avoid direct involvement with the ATS regime.

Scientists are important actors in the ATS regime. The political credibility of state actors in the regime is linked directly to their conduct of scientific research. ATCPs not originally party to the Antarctic Treaty must continue to support scientific research to retain their status. The Scientific Committee for Antarctic Research (SCAR) operates as the scientific agency of the ATS regime and is present as an observer at ATCMs. SCAR produces advice that makes it a source of knowledge in the ATS regime. CCAMLR has a Scientific Committee that has a similar role in relation to the Commission.

International organisations often participate in the decision-making procedures of the ATS regimes. In most instances this takes the form of observers invited to attend and contribute

to meetings. Common observers at an ATCM include the UN Food and Agriculture Organization (FAO), and the International Whaling Commission (IWC). CCAMLR allows the European Community (EC), a regional economic organisation, to act on behalf of its members in respect of some issue areas, and to exercise a vote.[57] Other international regimes can affect the ATS regime by touching on the same issue areas, such as the UN Convention on the Law of the Sea (UNCLOS) and the International Convention for the Prevention of Pollution from Ships (MARPOL).[58] The presence of observers from other international organisations allows information to be exchanged, cooperation can be facilitated, and it helps avoid duplication of effort.

The participation of the environmental NGOs in the ATS regime increased dramatically during the 1980s. The environmental NGOs have gained a greater degree of formal participation over time as observers in the consultation process, and accredited representatives usually have access to the meeting venue.[59] One such environmental organisation was the International Union for the Conservation of Nature (IUCN). Another was the Antarctic and Southern Ocean Coalition (ASOC), a transnational network of environmental groups, of which Greenpeace International is the largest member. Greenpeace also pursues an independent lobbying and pressure group role in relation to Antarctica and the Southern Ocean. Environmental NGOs have been agents for change in the ATS regime, and they have been successful where they have been able to gain state support. This has required the NGOs to acquire credible scientific expertise in Antarctica, that enables them to propose alternatives.

Summary

While actors are the participants in a regime and the issue area is its focus, principles and norms are the basic defining characteristics of a regime. Norms and principles determine the rules and decision-making procedures of a regime.[60] Changes in the rules and decision-making procedures are changes within a regime, provided the principles and norms are unchanged.[61] Changes in principles and norms represent fundamental political arguments,

[57] Appendix II, Article XII, (3) and (4).
[58] Christopher C. Joyner, op. cit., pp.99-101.
[59] Lorraine M. Elliott, op. cit., pp.58-59.
[60] ibid., p.11.
[61] Stephen D. Krasner, op. cit., p.3.

and are changes of the regime itself. This can result in a new regime for the issue area concerned, or no regime at all.[62] If the issue area contracts then the need for a regime may diminish, while if the issue area expands, the need for a regime, or for the development of other regimes, may increase. Change in the ATS regime has been incremental rather than involving an abrupt paradigm shift.[63] If the CCAMLR regime can cope with the IUU and by-catch issues by changing rules and procedures then it is at least marginally effective at coping with the issues. If the tensions between the goal of environmental protection, and the goal of rational use of the resource reduce the legitimacy of CCAMLR to participating actors, then CCAMLR will be less effective and could even become a 'dead letter' regime.

Drawing conclusions about this will require a close analysis of the rules and procedures of CCAMLR as they have evolved to deal with the issues of the Southern Ocean, and the wider debate over its effectiveness. If the principles, norms, rules, and decision-making procedures of a regime become less coherent, or if actual practice is increasingly inconsistent with principles, norms, rules, and decision-making procedures, then a regime is weakened.[64] The closer norms and principles match rules and procedures, the more coherent a regime is.[65] If CCAMLR is becoming less coherent, then it may be forced to adapt or change rapidly in the future in order to remain effective and to retain its legitimacy with the actors involved in the issue area.

The Development of Regime Theory

The number of regimes that exist in international relations has increased steadily over the last century. This growth is a reflection of the growing degree of interdependence in the modern international system. Regimes have been adopted to avoid sub-optimal outcomes in interstate relations. They are desirable where action by one or a few states is incapable of solving a particular international problem. Some study of regimes occurred during the era of the League of Nations, but the bulk of the analytical work and debate in this area has

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[62] ibid., p.4.
[63] According to Lorraine Elliott the Madrid Protocol was not a paradigm shift but an example of cognitive learning. As the values held by the actors changed, the strength of the sovereignty norms gave way partially to interdependence norms. Lorraine M. Elliott, op. cit., p.210.
[64] Stephen D. Krasner, op. cit., p.5.
[65] Lorraine M. Elliott, op. cit., p.11.

occurred since the Second World War.[66] The end of the Cold War has impacted on the study of regimes by bringing into focus some institutions, such as the United Nations (UN) or General Agreement on Trade and Tariffs (GATT)/World Trade Organisation (WTO), that had been concealed by the shadow of the Cold War conflict. These international[67] regimes or institutions have attracted attention as scholars have debated whether they have any influence in international relations, or if they are just peripheral epiphenomenona. Regime theory attempts to account for the impact of these organisations.

Can international regimes make a difference in international relations, and is the study of regimes is an area worth developing further? Regimes are important if they can actually shape the behaviour of the actors subject to the influence of the regime. Regime theory should be able to formulate generalisations that help explain or predict this shaping of behaviour, both at an individual level for individual actors, and at the collective level for multiple actors. While a regime may be established with the intention of changing behaviour in some manner, actual behavioural changes can be incidental or accidental to the efforts of the regime. Behavioural changes will not always contribute to the effectiveness of a regime, and on some occasions behavioural change will cause problems for a regime. Environmental regimes are interesting because of their potential to shape the behaviour of actors involved in environmental problems. The rise of environmental issues up the international agenda means that attention is now being devoted to environmental regimes as well as those that deal with security and economic issues. "International regimes not only deserve systematic study; they virtually cry out for it."[68]

The ATS and CCAMLR are examples of international regimes that play a role in international relations. One component of the role of these regimes is their contribution towards environmental conservation in Antarctica and the Southern Ocean. CCAMLR is also responsible for managing most of the fisheries in the Southern Ocean. By studying the reaction of the ATS as a whole, and the CCAMLR regime in particular, to the problems of IUU fishing and the by-catch of sea-birds in the Southern Ocean, it should be possible to

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[66] *International Organization*, the leading journal in the field, first appeared in 1947.
[67] Peter H. Sand, "International Cooperation: the Environmental Experience", in Jessica Tuchman Mathews, *Preserving the Global Environment: the Challenge of Shared Leadership*, W. W. Norton: New York, 1991, p.239. Prefers the term 'transnational' over 'international' because regimes are not confined to intergovernmental relations between nation-states.
[68] Robert O. Keohane, *After Hegemony: Cooperation and Discord in the World Political Economy*, Princeton University Press: Princeton, N.J., c1984, p.26.

make valuable observations about the factors of effectiveness for environmental regimes. Has CCAMLR succeeded in shaping the behaviours of actors in the Southern Ocean, and has any change in behaviour been desired by proponents of the regime?

A brief history of regime theory

In its history the study of international organisations has gone through several distinct chronological periods in which the major focus of analysis has changed and "the field is often described as being in a permanent search of its own 'dependent variable."[69] The first of these was a focus on formal institutions. The second focus concerned the actual decision-making procedures within international organisations. The idea that the formal arrangements of international organisations explained what they do was abandoned. This perspective explored the overall "patterns of influence shaping organizational outcomes."[70] The third focus abandoned the assumption that international governance is whatever international organisations do. Three distinct clusters of the actual and potential roles of international organisation in the process of international governance were developed. The first cluster emphasised the roles of international organisation in the resolution of substantive international problems.[71] The second cluster focused on the long-term institutional consequences of failing to solve substantive problems through the available institutional means. This was called the integrationist focus.[72] The third cluster criticised the transformational expectations of integration theory and focused on how international institutions "reflect and to some extent magnify or modify" the characteristic features of the international system.[73] The fourth and current focus is on international regimes. The concept of regimes reflected an attempt to fill a void in the field of international organisations that had developed as early assumptions were abandoned.[74] Today regime theory is no longer considered a passing fad of American scholars.[75]

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[69] Friedrich Kratochwil and John Gerard Ruggie, "International Organization: a State of the Art on an Art of the State", *International Organization*, 40 (4), 1986, p.755. See also J. Martin Rochester, "The Rise and Fall of International Organization as a Field of Study", *International Organization*, 40 (4), 1986, pp.777-813.
[70] Friedrich Kratochwil and John Gerard Ruggie, op. cit., p.756.
[71] ibid.
[72] ibid., p.757.
[73] ibid., p.758. Phrase is Stanley Hoffman's in "International Organization & the International System", *International Organization*, 24 (3), 1970, pp.389-413.
[74] ibid., p.759.
[75] J. Martin Rochester, op. cit., pp.777-778, comments on the tendency for "pack scholarship" in the field of international relations and at pp.799-802 argues that the popularity of the regime concept meant almost intellectual chaos for the international organisation field as it was too widely applied.

Current areas of regime theory

The three main schools of thought in regime theory can be classified as: neoliberal, or interest-based; realist, or power-based; and cognitivist, or knowledge-based schools of thought.[76] One area of difference between each school of thought is the degree of importance attached to the role of institutions in world politics. This in turn depends on assumptions made about actors and their motivations.

Interest-based, or neoliberal theories of regimes have come to represent the mainstream approach to analysing international institutions.[77] These theories emphasise the role that international regimes play in helping states realise common interests.[78] Neoliberals draw heavily on economic theories and game-theoretic models that portray states as rational egoists who care only for their own absolute gains. Interest-based theories tell us when and why regimes are desirable, but not when and how demand for regimes will be met. The functional nature of these theories run the risk of the *post hoc ergo propter hoc* fallacy where "institutions may be interpreted as having arisen because of the functions they must have served, when in fact they appeared for purely adventitous reasons."[79] In the future different questions will need to be asked about the beliefs actors have about the effects of regimes, and more tests will need to be aimed at non-regime cases.[80]

Power-based, or realist, theories of international regimes emphasise the "relative power capabilities and states' sensitivity to the distributional aspects of cooperation ... the realist state cares about benefits accruing to its competitors.",[81] unlike neoliberal states which feel no envy. Consequently regimes are harder to establish and may unravel easily if the distribution of power or benefits shifts. There are three power-based approaches: the hegemonic-stability theory, Krasner's power-oriented research program, and Joseph Grieco's integrated alternative.[82] The hegemonic-stability theory has declined in importance as it has become clear that regimes can emerge in the absence of a hegemon that uses power to establish and maintain regimes. With Krasner, regimes are of limited

[76] Andreas Hasenclever, Peter Mayer, and Volker Rittberger, op. cit., p.178.
[77] These theories are discussed at ibid., pp.183-196.
[78] ibid., p.183.
[79] Robert O. Keohane, op. cit., p.81.
[80] Andreas Hasenclever, Peter Mayer, and Volker Rittberger, op. cit., p.196.
[81] ibid.
[82] These theories are discussed at ibid., pp.196-205.

significance although they help states avoid uncoordinated activity and establish stability. Regimes themselves can be a source of power that facilitates change as substantive regime principles can provide a 'rallying point' for disadvantaged states.[83] Grieco's theory does not leave much room for international institutions to play a part. Regimes are useful for adjusting information asymmetry, facilitating side-payments, and may promote a norm of reciprocity.[84]

The third school of regime theory is the knowledge-based, or cognitivist school.[85] This school is critical of interest-based theories, arguing that neoliberalism's problems are derived from the assumptions that it derives from realism. Knowledge-based theories focus on the interests of states and the beliefs of decision-makers. Theories of 'weak cognitivism' do not represent a fundamental attack on rationalist theories, while 'strong cognitivism' embraces a far more pronounced institutionalism than in either neoliberalism or realism.[86] Weak cognitivism emphasises the importance of ideas, learning, and the role of epistemic communities. Ideas are important because if an actor's beliefs change then their perceived interests can change.[87] Learning occurs when changes in belief induce behavioural change. For knowledge or ideas to affect regimes they must be shared by key policymakers. The channel for ideas from specialists to decision makers has been called 'epistemic communities'.[88] Strong cognitivism makes a radical critique of rationalistic regime theory by "seeing international regimes as embedded in the broader normative structures of international society."[89] States may feel compelled to comply with norms and rules, even when they have both the incentive and capacity to break them, because norms and rules may have a compliance pull of their own.

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[83] ibid., p.201.
[84] ibid., p.204.
[85] These are discussed at ibid., pp.205-217.
[86] The first of these is the conception of states as rational actors, the second the static approach to the study of international relations, and the third its positivist methodology. ibid., pp.205-206.
[87] ibid., p.207.
[88] Peter Haas, "Introduction: Epistemic Communities and International Policy Coordination", *International Organization*, 46 (1), 1992, pp.1-35.
[89] Andreas Hasenclever, Peter Mayer, and Volker Rittberger, op. cit., p.210. This equates regimes with other fundamental institutions, like sovereignty, diplomacy, and international law, that provide the rules and norms that make interaction possible between states.

Critique of Regime Theory – Gaps in the Scholarship

Levy, Young and Zürn identified several gaps in the existing studies on regime theory, finding possible directions for future research and the need for a regime database.[90] There is a wide gap between theory and practice with international regimes. There is a lack of consensus on powerful generalisations. The dominant methodology in studying international regimes has been on focused case studies. These do not tend to generate general findings.[91] Linkages between different regimes also need to be dealt with. Linkages are widespread, and specific regimes are often embedded in larger systems of norms and principles.[92] The ATS regime has links to several other distinct regimes. This is not an area this thesis will concentrate on because "Conflating the analysis of regime effectiveness and the study of broader consequences is a recipe for confusion."[93] The areas of scholarship that this thesis will concentrate on are: effectiveness, epistemic communities, and regime change.

Problems with the consensus definition

The consensus definition of a regime presents two problems for regime theory. The first problem is in identifying the precise meaning of and the relationship among the four main components of regimes: principles, norms, rules, and decision-making procedures. Actors and issue areas have been easier to define and identify. There has been much debate over the definitions of the other terms and this is a source of criticism from realists who see regimes as epiphenomenona with indistinguishable components and vagueness of boundaries.[94] The second problem is in determining when a regime exists in a given issue area. Patterned behaviour can emerge in the absence of a regime and it does not presuppose cooperation.[95] Efforts to resolve this problem have focused on attempts to classify or identify different types of regimes.

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[90] Marc A. Levy, Oran R. Young, and Michael Zürn, op.cit., pp.312-321.
[91] ibid., p.319.
[92] ibid., p.317.
[93] Oran R. Young, "The Effectiveness of International Environmental regimes: A Mid-Term Report", *International Environmental Affairs*, 10, 1998, p.271.
[94] See Susan Strange, "Cave! Hic Dragones: a Critique of Regime Analysis", in Stephen D. Krasner, *International Regimes*, Cornell University Press, 1983, pp.337-354.
[95] Marc A. Levy, Oran R. Young, and Michael Zürn, op. cit., p.271.

One alternative to the problem of the disputes over the components of the consensus definition is to propose a simpler formulation to deal with the problem of indistinguishable components; one where the distinctions between principles, norms, rules, and procedures lack intersubjective meaning.[96] One example of this put forward by Robert Keohane collapsed the complex definition into a single concept of rules by defining regimes as "institutions with explicit rules, agreed upon by governments, that pertain to particular sets of issues in international relations."[97] This risks sacrificing the rich analysis that can be done using the consensus definition, such as being able to differentiate between different varieties of regime change.[98] The development of a strong theory is the best hope for overcoming the ambiguities in definitional matters: "the consensus definition and its alternatives should be thought of as *working definitions* that will grow more precise and more sophisticated as their surrounding edifice becomes more elaborated."[99]

One recent reworking of the consensus definition is the suggestion of defining international regimes "as social institutions consisting of agreed upon principles, norms, rules, procedures and programs that govern the interactions of actors in specific issue areas."[100] This allows a distinction to be drawn between regimes and the international organizations which are also material entities. So while CCAMLR is a regime it is also an international organisation, and while the ATS is a regime it is not yet an international organisation. One important difference here is that international regimes do not possess the capacity to act, while international organisations can.

A large variety of methods for identifying and classifying regimes have been proposed. One attempt to implement the consensus definition focused on explicit rules or observable behaviours,[101] while another approach argues that regimes are best identified on the basis of behavioural, cognitive, or formal criteria.[102] There is a risk of circular reasoning – by identifying a regime based on observed behaviour and then using the regime to explain the behaviour, but a purely formal implementation includes numerous ineffective 'paper

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[96] ibid., pp.273-274.
[97] Robert O. Keohane, *International Institutions and State Power: Essays in International Relations Theory*, Westview Press: Boulder, 1989 p.4.
[98] Andreas Hasenclever, Peter Mayer, and Volker Rittberger, op. cit., p.180. For example see the discussion at pp.23-24 above.
[99] Andreas Hasenclever, Peter Mayer, and Volker Rittberger, op. cit., p.183. Emphasis in the original.
[100] Marc A. Levy, Oran R. Young, and Michael Zürn, op. cit., p.274.
[101] ibid., p.271.
[102] Andreas Hasenclever, Peter Mayer, and Volker Rittberger, op. cit., pp.180-183.

regimes'.[103] The cognitive approach shifts its emphasis towards intersubjective meaning and shared understandings. This has been criticised for its data problems. Other possible typologies for regime classification include: principles and norms; rules; procedures and programs; actors and issue areas.

In deciding how best to study international regimes, pragmatic analytical reasons mean that regimes are often conceptualised as explicit rules and agreements that are agreed upon by actors and embodied in treaties or other documents.[104] This approach has its disadvantages because the existence of formal rules does not always translate into the existence of a regime in an issue area. As well as the degree of the formality of the rules a second dimension may be needed – the degree to which actor expectations converge.[105]

Figure 2

Regime Definitions[106]

	Convergence of Expectations	
Formality	Low	High
Low	no regimes	tacit regimes
High	dead letter regimes	classic regimes

'Dead letter regimes' feature rules, but lack the same degree of compliant behaviour as a classic regime. Tacit regimes have more informal rules and behaviour that is consistent with independently inferred rules.[107] CCAMLR and the ATS regime fit the pattern for a 'classic regime' in which both rules and rule-consistent behaviour exist. Most would agree that a regime exists when these conditions are met. This can be inferred when: "(1) clear violations remain the exception, (2) parties harmed by violations protest against them by implicitly or explicitly referring to the agreed upon rules and (3) violators do not deny the

[103] "It would be circular reasoning to identify regimes on the basis of observed behaviour, and then to use them to 'explain' observed behaviour." Robert O. Keohane, "The Analysis of International Regimes: Towards a European-American Research Programme", Volker Rittberger (ed), in *Regime Theory and International Relations*, Oxford: Clarendon Press, 1993, p.27.
[104] Andreas Hasenclever, Peter Mayer, and Volker Rittberger, op. cit., p.182.
[105] Marc A. Levy, Oran R. Young, and Michael Zürn, op. cit., p.272.
[106] Reproduced from Marc A. Levy, Oran R. Young, and Michael Zürn, op. cit., p.272.
[107] See Charles Lipson, "Why are some International Agreements Informal?", *International Organization*, 45 (4), 1991, pp.495-523 and 532-538.

rules and norms referred to in these protests."[108] Major or long-term non-compliance brings the existence of the regime into question. An institutional structure might survive past the effective end of the regime it was a part of, much as the League of Nations did.

Regime effectiveness

In the field of regime theory recent studies have focused on international environmental regimes. This is an area conducive to the analysis of the new analytical and normative concerns underlying regime analysis.[109] It helps addresses some of the blank spots in knowledge about regime theory, which are due to the earlier emphasis on security and economic regimes. Many environmental regimes are of comparatively recent origins, the product of negotiations in the 1980s and 1990s. The case study in this thesis focuses on how effective the CCAMLR regime has been in dealing with the environmental problems of IUU and by-catch. Because focusing on other dimensions of effectiveness could lead to a view that CCAMLR was effective without solving the problems it faces, this thesis will focus on the dimension of effectiveness as problem-solving, without trying to lose sight of the other dimensions of effectiveness.[110]

Different definitions of regime effectiveness will lead to different judgements about regime effectiveness.[111] A legal definition measures the extent to which conflicts are regulated and contractual obligations are met. A policy-oriented definition focuses on goals and goal attainment. A political definition investigates changes in actor behaviours and interactions and how that affects the problem. Levy, Young, and Zürn presented the following definition: "effectiveness is a matter of the degree to which a regime ameliorates the problem that prompted its creation."[112] According to Hasenclever, Mayer, and Rittberger, "Regime *effectiveness* compromises two overlapping ideas. First a regime is effective to the extent that its members abide by its norms and rules. Second, a regime is effective to

[108] Marc A. Levy, Oran R. Young, and Michael Zürn, op. cit., p.272.
[109] ibid., p.268.
[110] Oran Young described six different dimensions to the concept of effectiveness: effectiveness as problem-solving, effectiveness as goal attainment, behavioural effectiveness among regime member, process effectiveness in domestic implementation, constitutive effectiveness of social practices, and evaluative effectiveness. Oran R. Young, *International Governance: Protecting the Environment in a Stateless Society*, Cornell University Press: Ithaca, 1994, pp.142-152.
[111] Marc A. Levy, Oran R. Young, and Michael Zürn, op. cit., pp.291-292.
[112] ibid., p.291.

the extent that it achieves the objects or purposes for which it is intended."[113] Regime resilience to external change also helps explain why regimes matter.[114] This is an area addressed by Stokke and Vidas when they investigated the effectiveness of the ATS and CCAMLR regimes by looking in part at how they dealt with external challenges to ATS authority. They also use a problem-solving definition of effectiveness: "the effectiveness of a regime is understood as the impact it has on certain *problems* which it addresses".[115]

Effectiveness and compliance

The extent to which CCAMLR members abide by, or comply with, the norms or rules of the regime is an important factor in effectiveness. Effectiveness is linked conceptually with compliance but is still distinct from it. Ronald Mitchell defined compliance as "an actor's behaviour that conforms to a treaty's explicit rules."[116] Although compliance does not necessarily equate with effectiveness, more compliance will usually lead to a more effective regime than less compliance will,[117] but Mitchell found that "Greater compliance is neither a necessary nor sufficient condition for effectiveness."[118] Young in 1998 preferred the use of behavioural consequences as a measure of regime effectiveness, such as outputs, outcomes, and impacts. This was because "a turn toward implementation and compliance as a way of conceptualizing effectiveness is apt to be accompanied by a loss of analytic rigor and a constant battle with empirical messiness."[119]

There is often a separation between the members of a regime, and those actors whose behaviour is the ultimate target of action taken by that regime. For the CCAMLR regime, while states are members, it is often the behaviour of fishing companies which is being targeted. Implementation of regime rules requires domestic prescriptions. It remains an open question what kind of domestic structure is most effective.[120] There is a need to

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[113] Andreas Hasenclever, Peter Mayer, and Volker Rittberger, op. cit., p.178. Emphasis in the original.
[114] ibid.
[115] Olav Schram Stokke and Davor Vidas, op. cit., p.15. Emphasis in the original.
[116] Ronald B. Mitchell, "Compliance Theory: An Overview", in James Cameron, Jacob Werksman, and Peter Roderick, *Improving Compliance with International Environmental Law*, Earthscan Publications Ltd, London, 1996, p.5.
[117] "Regimes with strong compliance mechanisms can be expected to alter the behavior of regime participants considerably." Marc A. Levy, Oran R. Young, and Michael Zürn, op. cit., p.278.
[118] Ronald B. Mitchell, op. cit., p.25.
[119] Oran R. Young, "The Effectiveness of International Environmental regimes: A Mid-Term Report", *International Environmental Affairs*, 10, 1998, p.269.
[120] Marc A. Levy, Oran R. Young, and Michael Zürn, op. cit., p.315.

identify the sources of compliance other than the enforcement and sanctions model and to get beyond the idea that the probability of being caught and punished is the key determinant in compliance. The absence of central enforcement may not be a critical weakness for a regime. Numerous sources of compliance may operate simultaneously.

Compliance is valuable if it leads to accomplishing the goals of a regime. However, even if the behaviour of the actors involved has changed, this may not be enough to address the problems for which a regime was created. If the rules are weak, then compliance may not lead to effective problem-solving. The fact that an actor is compliant with the rules of a regime does not necessarily mean that a regime itself has induced that compliance. Compliance can occur as a result of independent self-interest. In these instances the rules of a regime will reflect existing and intended future behaviours, and compliance is not caused by the regime but merely coincides with it.[121] Compliance can also occur as a result of interdependent self-interest. In these instances the presence of a regime may over time reinforce the incentives for compliance.[122] Legitimate rules exert a normative pull toward compliance.[123]

There are a variety of reasons for non-compliance. Non-compliance can occur as the preference of actors because the benefits of compliance do not outweigh the costs. A state can be interested in signing a treaty but not complying with it. This can be the result of a 'free-rider' seeking to avoid the costs of compliance, because the resources required for compliance need to be used elsewhere, or because the actor does not value the benefits of compliance.[124] Non-compliance can occur due to the incapacity of the actors involved. The actor may lack the financial, administrative, or technological capabilities to comply. This is often a problem for developing countries.[125] Non-compliance may also be due to inadvertence. While the actors sincerely intend to comply with the rules of a regime they are unable to. This can occur where a target set in good faith when conditions were uncertain is found to be impossible to achieve.[126] The control that states have over

[121] Ronald B. Mitchell, op. cit., pp.7-9.
[122] ibid., pp.9-11.
[123] Marc A. Levy, Oran R. Young, and Michael Zürn, op. cit., p.277.
[124] Ronald B. Mitchell, op. cit., pp.11-12.
[125] ibid., pp.12-13.
[126] ibid., p.13.

individual activities involved in marine resource management is tenuous.[127] One method of overcoming non-compliance is to give positive rewards for compliance in order to increase the incentives for compliance. Another remedy is deterrence through the threat or use of sanctions, which raises the problems of enforcement.

Effectiveness and enforcement

Enforcement is an activity conducted by the actors involved with a regime to induce compliance with the rules and norms of a regime. Enforcement can involve the use of sanctions. To be effective sanctions have to be both credible and potent.[128] Social opprobrium is a form of sanction through diplomatic efforts that can be used to pressure actors to comply. Specific reciprocity, "promising to comply if others comply and threatening to violate if others violate",[129] can also be used to elicit compliance, although it can be difficult to implement in a multilateral environment.[130] Enforcement of the rules of the CCAMLR regime against individuals acting on the high seas requires detection. This raises the question of who is collecting and interpreting this information, and what use they will put it to.

The ATS regime is not empowered to implement punitive sanctions when rules are breached, relying on the actions of its members. Even if it was so empowered the consensus rule would probably prevent joint sanctions from being implemented. The CCAMLR executive secretary has a limited ability to close fisheries,[131] but this is reliant on the members implementing the fishery closure among their flagged fishing vessels. The possibility of unilateral sanction by individual actors is possible. The United States has used the threat of unilateral sanctions to encourage countries to comply with CITES and the IWC, but has only once imposed trade sanctions in relation to a violation of an

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[127] Gregory Rose and George Paleokrassis, "Compliance with International Environmental Obligations: A Case Study of the International Whaling Commission", in James Cameron, Jacob Werksman, and Peter Roderick, *Improving Compliance with International Environmental Law*, Earthscan Publications Ltd: London, 1996, p.149.

[128] Leesteffy Jenkins argues in favour of sanctions in "Trade Sanctions: Effective Enforcement Tools", in James Cameron, Jacob Werksman, and Peter Roderick, *Improving Compliance with International Environmental Law*, Earthscan Publications Ltd: London, 1996, pp.221-228.

[129] Ronald B. Mitchell, op. cit., p.16.

[130] ibid., pp.15-16.

[131] CCAMLR Conservation Measure 61/XII 'Ten-day Catch and Effort Reporting System' allows the Executive Secretary to close a fishery once the total allowable catch has been completed.

international environmental agreement.[132] This form of sanction can cause some tension with the free trade principles of the WTO.

The concept of an epistemic community

The concept of epistemic communities rests on some general assumptions about the world today. Firstly, science and the provision of scientific advice is extremely important in modern society. Secondly, conditions of uncertainty create a need for advice in policy determination. Uncertainty is a situation in which actors must make decisions without adequate information about the issue, or where the consequences of their actions are not well understood. CCAMLR was created in conditions of uncertainty, and although improved today, the provision of scientific advice remains an integral part of policy-making in CCAMLR. The definition of an epistemic community offered by Peter Haas is that:

> An epistemic community is a network of professionals with recognized expertise and competence in a particular domain and an authoritative claim to policy-relevant knowledge within that domain or issue-area. Although an epistemic community may consist of professionals from a variety of disciplines and backgrounds, they have (1) a shared set of normative and principled beliefs, which provide a value-based rationale for the social action of community members; (2) shared causal beliefs, which are derived from their analysis of practices leading or contributing to a central set of problems in their domain and which serve as the basis for elucidating the multiple linkages between possible policy actions and desired outcomes; (3) shared notions of validity – that is, intersubjective, internally defined criteria for weighing and validating knowledge in the domain of their expertise; and (4) a common policy enterprise – that is, a set of common practices associated with a set of problems to which their professional competence is directed, presumably out of the conviction that human welfare will be enhanced as a consequence.[133]

Epistemic communities "differ from interest groups in that the epistemic community members have shared causal beliefs and cause-and-effect understandings. If confronted with anomalies that undermine their causal beliefs, they would withdraw from the policy debate, unlike interest groups."[134] Interest groups and social movements have shared principled beliefs, but not shared causal beliefs. The broader scientific community is

[132] Leesteffy Jenkins, op. cit., p.225.
[133] Peter M. Haas, "Introduction: Epistemic Communities and International Policy Coordination", *International Organization*, 46 (1), 1992, p.3.
[134] ibid., p.18.

different because of the lack of the shared normative commitments found in an epistemic community.[135] They have shared causal beliefs, but not shared principled beliefs.

It can take a shock or crisis to overcome inertia, to realise that uncertainty exists and that advice from an epistemic community is needed. Information generated by an epistemic community can also create that shock.[136] There are four areas in which an epistemic community can be of assistance:

> "First, following a shock or crisis, epistemic communities can elucidate the cause-and-effect relationships and provide advice about the likely results of various courses of action ... Second, epistemic communities can shed light on the nature of the complex interlinkages between issues and on the chain of events that might proceed either from failure to take an action or from instituting a particular policy ... Third, epistemic communities can help define the self-interests of a state or factions within it ... Fourth, epistemic communities can help formulate policies."[137]

In less politically motivated cases epistemic communities can have even greater influence in the policy-making process by pointing out which alternatives are viable.[138] Epistemic communities aim to control problems not societies so they "should not be mistaken for a new hegemonic actor that is the source of political and moral direction in society ... Epistemic communities are neither philosophers, nor kings, nor philosopher-kings."[139]

Adler and Haas argue that epistemic communities can influence the creation and maintenance of international regimes at four stages: policy innovation; policy diffusion; policy selection; and policy persistence. Policy innovation allows epistemic communities to exert influence by: "(1) framing the range of political controversy surrounding an issue, (2) defining state interests, and (3) setting standards."[140] For policy diffusion: "Epistemic community members play both direct and indirect roles in policy coordination by diffusing ideas and influencing the positions adopted a by a wide range of actors, including domestic and international agencies, government bureaucrats and decision makers, legislative and corporate bodies, and the public."[141] The size of an epistemic community tends to be very

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[135] ibid., p.19.
[136] ibid., p.14.
[137] ibid., p.15.
[138] ibid., p.16.
[139] Emanuel Adler and Peter M. Haas, "Conclusion: Epistemic Communities, World Order, and the Creation of a Reflective Research Program", *International Organization*, 46 (1), 1992, p.371.
[140] ibid., p.375.
[141] ibid., p.379.

small, often under thirty-five people. What matters is the respect and influence within their discipline that the epistemic community members have. The timing of the idea is also important. An epistemic community can be a very transient creation. When it comes to policy selection: "Epistemic communities create reality, but not as they wish."[142] Political factors and other considerations affect solicitation and use of advice from epistemic communities. Policy persistence occurs through socialisation and persistence by an epistemic community. "New ideas and policies, once institutionalized, can gain the status of orthodoxy."[143] One factor affecting persistence is the maintenance of consensus within the epistemic community. If consensus is lost then authority is diminished and decision makers pay less attention to advice.[144] Communities that lose their consensus can generate disagreements leading to a loss of influence, or even the collapse of regimes they have defended.[145]

Karen Litfin points out that under conditions of uncertainty the norm is more likely to be "epistemic dissension"[146] than consensus. The knowledge may be consensual, but the interpretations of it can vary.[147] In a more general criticism of the definition of epistemic communities Litfin notes that: "First, it skirts epistemological questions. Second, it is overly optimistic about the ability of consensual knowledge to minimize political conflict. Third, it reduces the power of epistemic communities to conventional political skills, thereby ignoring the central dimension of rhetorical competence."[148] Litfin argued that the role played by 'knowledge-brokers' may be more useful in explaining how a particular policy is adopted. A knowledge-broker is an intermediary between the producers of the knowledge and the policy-makers who use that knowledge.[149] A knowledge-broker frames and interprets the science,[150] translating and communicating knowledge, rather than engaging in policy advocacy.[151] Access to information is crucial for a knowledge-broker to be in a position to influence how it is disseminated. Litfin is highly critical of the primacy

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[142] ibid., p.381.
[143] ibid., p.384.
[144] ibid., p.385.
[145] Andreas Hasenclever, Peter Mayer, and Volker Rittberger, op. cit., p.210.
[146] Karen T. Litfin, *Ozone Discourses: Science and Politics in Global Environmental Cooperation*, Columbia University Press: New York, 1994, p.12.
[147] ibid., pp.78-79.
[148] ibid., pp.50-51.
[149] ibid., p.4.
[150] ibid., p.10.
[151] ibid., p.119.

of consensual knowledge and argues that what is really important is discourse not consensus.

Evolution has been used as a metaphor for epistemic communities, but this metaphor has its limits because ideas do not become extinct - they are kept for future use.[152] Reality is socially constructed and ideas inform policy. "While epistemic communities provide consensual knowledge, they do not necessarily generate truth."[153] Organisations are not always captured by an epistemic community. "Members of epistemic communities involved in environmental regimes have subscribed to holistic ecological beliefs about the need for policy co-ordination subject to ecosystemic laws."[154] This suggests a good fit for CCAMLR, because its policies try to manage the entire ecosystem of the Southern Ocean.

This is a tempting area to explore because no one has investigated the CCAMLR regime closely enough to establish evidence of an epistemic community, with the exception of Lorraine Elliott.[155] If such an 'invisible college' can be identified a contribution to theory may be made by exploring how it has worked in reality with the IUU and by-catch issues and what its contribution to the effectiveness of the CCAMLR regime has been. Cognitivists have argued that "when epistemic communities are widely spread, even in the absence of leadership by a strong state, environmentally effective regimes are possible."[156] This can happen through epistemicly informed bargaining, and epistemic communities are supposed to be most influential during a shock or crisis. It will be interesting to examine the sources of ideas, discourse, and leadership in CCAMLR as it attempts to deal with its problems.

Epistemic communities – the other groups problem

The concept of epistemic communities may be an important contribution in understanding the role of the scientific community in regimes, but the concept has been criticised. Dave Toke has questioned their alleged dominance over environmental policy at the expense of

[152] Emanuel Adler and Peter M. Haas, op. cit., p.372.
[153] Peter M. Haas, op. cit., p.23.
[154] Peter M. Haas, "Epistemic Communities and the Dynamics of International Environmental Co-operation", in Volker Rittberger (ed), *Regime Theory and International Relations*, Clarendon Press: Oxford, 1993, p.180.
[155] See Chapter 6, pp.273-275.
[156] ibid., p.188.

environmental groups.[157] "Environmental groups do not have the same canons of validity as epistemic communities simply because their principles do not require such tests."[158] Toke argued that environmental groups can be just as important as epistemic communities when it comes to shaping the interpretation or form, and acceptance or projection of norms. Toke questions whether scientists are in a better position to be the bearers of the truth because "it is extremely difficult to find an environmental issue that does not depend on normative, socially constructed, as opposed to positivistically inspired judgements".[159] Toke argued that when scientists are divided, then environmentalists are still able to advocate.

Claire Dunlop replied to these criticisms and expanded on them.[160] "It is not in dispute that Haas has failed to produce an approach capable of accommodating the multiplicity of actors, epistemic and non-epistemic, who at various junctures influence the norms of decision-makers and, crucially, of one another."[161] The point of distinction with environmental groups is that "the claims to influence by interest groups or social movements would not be undermined decisively by the discovery of technical anomalies which are irreconcilable with the received wisdom."[162] Among the problems there is an inability to explain interactions of epistemic communities with other actors, and a lack of critical empirical testing. The basic methodological complexity of implementing such a micro-level approach, means that identifying an epistemic community can be very difficult. Dunlop believes that the current approach remains that of 1992, with contradictions and omissions in the idea that remain hidden and await exploration.[163]

'Other groups' are a problem in that they exist as potential rivals or allies to the epistemic communities: "the much-vaunted 'consensual knowledge' may overstate the influence these expert enclaves *alone* can have."[164] James Sebenius argued that being apolitical yet politically empowered seems unfeasible. Influence arises from bargaining with other actors

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[157] Dave Toke, "Epistemic Communities and Environmental Groups", Politics, 19 (2), 1999, pp.97-102.
[158] ibid., p.99.
[159] ibid., p.102.
[160] Claire Dunlop, "Epistemic Communities: A reply to Toke", *Politics*, 20 (3), 2000, pp.137-144.
[161] ibid., p.137.
[162] ibid., p.138.
[163] ibid., p.141.
[164] ibid. Emphasis in the original.

that turns a 'natural coalition' into a 'winning coalition'.[165] Success may require other politically astute groups to be involved. The current framework of epistemic communities is unable to accommodate bargaining.[166] Dave Toke noted the blurred roles between scientific and environmental groups: "environmental groups can sponsor scientific research and scientists can sometimes explicitly appeal to normative objectives."[167] Environmental groups can link the concerns of different epistemic communities together. "The test that is increasingly applied to the scientists who are variously backed by environmentalists or business interests is how much their arguments and findings resonate with an increasingly democratised public debate."[168] Credibility depends on producing information via a process that is transparent, procedurally fair, and dominated by professional norms.[169] States are not losing their place as dominant actors, but NGOs are gaining influence in regimes. NGOs have both the desire and the capacity to intervene and can play a role in framing issues, acting as watchdogs, or pressure groups.

Regime change

In the past, attention has focused on regime creation, but regimes change continuously over time and some decline or go out of existence. Do regimes have identifiable life cycles and can propositions be developed about the process of growth and decay?[170] Oran Young observed that regimes may have a life cycle, usually growing in effectiveness over time, but in some cases outliving their usefulness.[171] The CCAMLR case study may potentially be that of a regime in decline, and if so, then it may be able to reveal some potential generalisations about regimes in decline. Robert Keohane and Joseph Nye developed four models for understanding regime change: "(1) economic processes, (2) the overall power structure in the world, (3) the power structure within issue areas, and (4) power capabilities as affected by international organization."[172] These models may be useful in explaining change in the CCAMLR regime.

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[165] James K. Sebenius, "Challenging Conventional Explanations of International Cooperation: Negotiation Analysis and the Case of Epistemic Communities", *International Organization*, 46 (1), 1992, pp.325-326.
[166] Claire Dunlop, op. cit., p.142.
[167] Dave Toke, *Green Politics and Neo-liberalism*, Macmillan Press Ltd: London, 2000, p.72.
[168] ibid., p.74.
[169] Robert O. Keohane and Joseph S. Nye, *Power and Interdependence*, third edition, Longman: New York, 2001, p.225.
[170] Marc A. Levy, Oran R. Young, and Michael Zürn, op. cit., p.318.
[171] Oran R. Young, op. cit., p.272.

The economic process model focuses on using technological and economic changes to explain regime change.

> "The first premise of an economic process model of regime change is that technological change and increases in economic interdependence will make existing international regimes obsolete .... The second premise is that governments will be highly responsive to domestic political demands for a rising standard of living ... The third premise of this model is that the great aggregate economic benefits provided by international movements of capital, goods, and in some cases labor will give governments strong incentives to modify or reconstruct international regimes to restore their effectiveness ... Thus, regime change will be a process of gradually adapting to new volumes and new forms of transnational economic activity."[173]

The problems of this model lie in its weak treatment of politics. It abstracts from interests that may diverge between different groups, and assumes that politico-military decisions are separate from economic decisions.[174]

The overall power structure explanation assumes that the distribution of military power between states determines the power structure of the international system, which in turn determines the nature of international regimes.[175] The appeal of this model lies in its simplicity and parsimonious prediction. As the power of states changes, so the rules of international regimes will change accordingly. The model predicts a strong tendency towards congruence of outcomes among issue areas due to the fungibility of military power.[176] Leadership in maintaining a regime is most likely in a hegemonial system, where leadership requires foregoing short term gains in order to preserve the regime.[177] Changes in power, such as a situation of eroding hegemony, can bring about the subsequent end of the regime. The problems of this model lie in the difficulty it has in explaining change when the United States continued to hold military dominance, but declined relatively in the global economy. More factors are required to account for post World War Two changes in threat perception, relative economic strength, and the process of decolonisation.[178]

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[172] Robert O. Keohane and Joseph S. Nye, op. cit., p.33.
[173] ibid., pp.34-35.
[174] ibid, pp.35-36.
[175] ibid., pp.36-37.
[176] ibid., p.37.
[177] ibid., p.38.
[178] ibid., pp.40-42.

The issue structure model holds that power capabilities among states are not easily transferred between different issue areas, and different issue areas will have different power structures. This model is similar to the overall structure model in that the strong states (in an issue area) will make the rules.[179] The model assumes that attempts to draw linkages between different issue areas will be unsuccessful. Less powerful as a theory because it requires more information, but it is a more discriminating theory as the analysis of politics is conducted by issue area. The model distinguishes between activity within a regime and activity influencing the development of a new regime, as the power resources used in the two areas can differ.[180] Regime change occurs "because of the difference between influence and benefits under an existing regime and the expectations of dissatisfied states about the effects of new rules."[181] Understanding regime change requires understanding both structure and process, the way in which capabilities become outcomes. A simple structural explanation involves a shift of overall or issue-specific capabilities leading to regime change. A sophisticated structural explanation has a regime creating a bargaining process, which leads to a pattern of outcomes. If the pattern is incongruous with power structure (overall or issue specific) there will be regime change to reduce incongruity.[182] The issue structure model has its problems. Successful issue linkage means outcomes are no longer dependent on power resources in the issue area, and linkage can come from weak states.[183] The model also ignores domestic and transnational actors. Simplicity is a good starting point for analysing regime change, but provides only a partial explanation.

The international organisation model uses the term 'international organisation' to refer to multilevel linkages, norms and institutions, intergovernmental and transgovernmental ties. This model treats networks, norms and institutions as independent variables in explaining regime change. Once established international organisation will be hard to eradicate or rearrange.[184] "Power over outcomes will be conferred by *organizationally dependent capabilities*, such as voting power, ability to form coalitions, and control of elite networks."[185] The model provides a dynamic of regime change, and allows for regime

[179] ibid., p.43.
[180] ibid., p.44.
[181] ibid., p.45.
[182] ibid., p.46.
[183] ibid., p.45
[184] ibid., p.47.
[185] ibid., p.48. Emphasis in the original.

inertia. International regimes can be changed by decisions that are affected by international organisation. One major source of regime change is other organisations. The model does have its problems, because it is complicated and requires more information, it does not predict change from a single variable and is less deterministic. The factors in this model are more temporary and reversible than with the structural models, and if states chose to destroy regimes, then structural models become more important.[186]

Do regimes matter?

The realist argument that regimes are epiphenomenona is dealt with by answering the question about whether or not regimes make a difference in international relations. In determining if regimes do make a difference most regime research has focused on four interrelated questions: regime creation, regime persistence, regime consequences - do regimes make a difference - and long term consequences. Developing a comprehensive theory of regimes will require addressing all of these questions.[187] Regime creation is an area of regime theory that has received a lot of attention in the past but will not be a major focus of this thesis because the ATS has already been well covered by existing scholarship.[188] Each school of thought focuses on a specific variable in the study of international regimes:

> Neoliberals stress self-interest as a motive for cooperation among states and for the creation of, and compliance with, international regimes. Realists emphasize that considerations of relative power affect the substance of international regimes and circumscribe their effectiveness and robustness. Cognitivists point out that both the perceptions of interests and the meanings of power capabilities are dependent on actors' causal and social knowledge.[189]

Attempts are being made to formulate a synthesis of the different schools.

When it comes to effectiveness the central questions are: "Do regimes matter and what proportion of the variance in world affairs is attributable to the operation of these

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[186] ibid., pp.49-50.
[187] Marc A. Levy, Oran R. Young, and Michael Zürn, op. cit., pp.268-269.
[188] For examples of works that focus on regime creation see Gail Osherenko and Oran R. Young, *Polar Politics: Creating International Environmental Regimes*, Cornell University Press: Ithaca, 1993, M. J. Petersen, *Managing the Frozen South: The Creation and Evolution of the Antarctic Treaty System*, University of California Press: California, 1988, Marc A. Levy, Oran R. Young, and Michael Zürn, op. cit., pp.279-287, and Chapter 1 of Oran R. Young, *Creating Regimes: Arctic Accords and International Governance*, Cornell University Press: Ithaca, 1998.

institutional arrangements."[190] Oran Young has put forward the concept of a 'hard case' as an analytical device to test if a regime makes a difference even during adverse conditions. "A hard case when it comes to the effectiveness of international institutions is a situation in which participants have both incentives and opportunities to disregard or change institutional requirements."[191] Factors leading to this condition include:

> One or more of the prominent members of the subject group are predisposed to dislike the outcomes they expect a regime to produce. It is comparatively easy to violate the rules of the regime either without detection or in such a way that incontrovertible evidence of the violation is difficult to obtain. Ongoing changes in the character of international society raise doubts about the sociopolitical or intellectual underpinnings of the regime.[192]

The more factors that are present the harder the case is for an institution to have some influence in shaping behaviour. If institutions can survive and shape behaviour in hard cases then they should be more influential under more benign conditions.[193]

The CCAMLR regime meets several of the hard case criteria in respect of the IUU and seabird by-catch issues. If the CCAMLR Commission moves to impose further restrictions on fishing in the Southern Ocean then the CCAMLR members that conduct fisheries there are unlikely to be satisfied with the outcome. If the CCAMLR regime fails to address the problem then the conservation minded members are unlikely to be satisfied with the outcome. In the past it has been easy to violate the CCAMLR rules and avoid detection, although with the introduction of VMS and the more active enforcement of Southern Ocean EEZ by some states this is more difficult than it was. It has still proven difficult to punish individual actors within CCAMLR member states that have been responsible for IUU fishing in the Southern Ocean. While elements of the regime are being disregarded it will be interesting to investigate changes in the regime that are being attempted or implemented. The environmental NGOs may be presenting a challenge to the 'rational use' principle of the CCAMLR regime through their calls for a moratorium on fishing for toothfish, although whether this represents a wider change in the character of international

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[189] Andreas Hasenclever, Peter Mayer, and Volker Rittberger, op. cit., p.217.
[190] Oran R. Young, "The Effectiveness of International Environmental regimes: A Mid-Term Report", *International Environmental Affairs*, 10, 1998, p.270.
[191] Young, Oran R., ""The Effectiveness of International Institutions: Hard Cases and Critical Variables", in James N Rosenau, and Ernst-Otto Czempiel (eds), *Governance Without Government: Order and Change in World Politics*, Cambridge University Press: Cambridge, 1992, p.165.
[192] ibid., p.166.
[193] ibid.

society is not clear. This could be demonstrated by a change in the values of fishing states to reflect a conservation goal. The significance of this call for a moratorium is that it has the potential to undermine the interest that fishing states have in continued membership of CCAMLR or with continued compliance with its rules. This is a hard case because there are incentives and opportunities to disregard or change the regimes requirements.

The assertion that regimes make a difference by altering calculation of actors' interest or changing capabilities has been elaborated but not rigorously tested. The impact of regimes on the self-interest of governments can have two effects on state strategies. First, a regime can act as a focal point for expectation convergence. By reducing uncertainty and providing guidelines for legitimate actions, the regime creates feasible patterns for agreement. In the long run a state may change its self-interest to match the rules of the regime. Second, a regime can constrain behaviour by limiting access to decision-making and prohibiting some actions. Violators of regime rules can find that their reputation is affected.[194] There is a need to trace the behaviours of states to see how closely policies actually follow regime principles, rules, and institutions. The impact of regime can be found by tracing "internal decision-making processes to discover what strategies would have been followed in the absence of regime rules." On what issues did self-interest clash with regime rules? Did incentives to abide by rules outweigh incentives to break rules? How much impact did the regime rules have? Do regimes promote their own growth?[195]

Methodology for the Analysis Chapter

In analysing the CCAMLR regime there are a large variety of factors and variables that can be studied, and several different techniques for doing so. Two of the main styles of analysis are natural experiments focused on the issue area over time, and thought (or counter-factual) experiments. Oran Young stated in 1994 that "our understanding of the determinants of effectiveness in international governance systems is rudimentary at this stage".[196] What are the factors that operate as determinants of regime effectiveness? The issue here is the tension between parsimony and explanatory power. Single factor accounts

[194] Robert O. Keohane and Joseph S. Nye, op. cit., p.279.
[195] ibid., p.280.
[196] Oran R. Young, *International Governance: Protecting the Environment in a Stateless Society*, Cornell University Press: Ithaca, 1994, p.160.

are simple to articulate but do not hold up well to empirical examination.[197] The eight factors that this thesis will explore as determinants of problem-solving effectiveness for the CCAMLR regime are: transparency; robustness; transformation rules; capacity of governments; distribution of power; interdependence; issue area; and intellectual order. This is done partly for ease of analysis, and also because a boundary line needs to be drawn to prevent the devising of new factors ad infinitum. Intellectual order as a factor overlaps with the methodology that will be used for investigating the concept of epistemic communities in the CCAMLR regime.

The problems of case studies

The dominant methodology in regime research has been focused case studies. There is reason to be concerned with the selection bias resulting from this, because it makes natural experiments based on variance in the elements used to classify regimes difficult. This thesis is based on the case study of the CCAMLR sub-regime within the broader framework of the ATS regime. The approach being taken is to assess the effectiveness of one issue area, that of IUU fishing and the associated problem of incidental mortality. However, different issue areas are not always neatly separated in the real world and developments in one issue area can affect other areas. It is difficult to analyse broader effects due to the complexity of the situation.[198] In this respect regimes are useful for social learning and broader learning occurs when "a principle applicable to more than one issue area proves successful in specific cases."[199] An increasing density of international regimes may even initiate movement towards political integration.[200] A second area of broader consequences are between international society and transnational relations. Regimes contribute towards the rise of transnational issue networks, epistemic communities, and transnational social movements. This contributes to the growing challenge towards traditional notions of sovereignty.[201] Because of the difficulty in analysing broader consequences this is not an area that this thesis will focus on. This is because of the need to compare and contrast regimes across different issue areas and the CCAMLR case study is focused on one issue area.

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[197] ibid., p.152.
[198] Marc A. Levy, Oran R. Young, and Michael Zürn, op. cit., p.308.
[199] ibid., p.309.
[200] ibid., p.310. Keohane and Nye discussed the trend towards an incipient global society, but found no trend towards supranational organisations, Robert O. Keohane and Joseph S. Nye, op. cit., p.274 and 277.

Natural experiments

Natural experiments can be used to compare different issue areas or a single evolving regime over time. A natural experiment could be used for CCAMLR if there are "situations that remain largely unchanged over time except for alterations in the character of the prevailing regime."[202] In this respect the performance of CCAMLR in dealing with the IUU and by-catch problems can be measured against earlier efforts to conserve other fisheries stocks in the Southern Ocean. One critical area for observing differences will be to analyse the impact of the conservation measures that are implemented by the Commission. These measures represent the rules of the CCAMLR regime, and may also indicate normative changes that may be taking place in the regime.

Thought experiments

Analysing the effectiveness of the CCAMLR regime may be done with thought experiments and the construction of counter-factual arguments. This: "technique involves a rigorous effort to recontruct [sic] the flow of events as it would have unfolded in the absence of some key factor ... and to compare the results with the actual flow of events."[203] The causal pathways that are constructed for this need to be carefully supported with empirical evidence.[204] As has been pointed out "the real measure of a regime's effectiveness involves a comparison with what would have happened if the regime had never existed."[205] It can be difficult to isolate the impact of a regime on its issue area. One way of overcoming the problem of comparing the outcomes is to focus on the process. Counter-factual arguments need to be carefully framed to allow the behaviour of key actors at critical junctures to be studied. This involves looking at the decision-making processes within the Antarctic Treaty and CCAMLR regimes, focusing on the important branching points, and asking what path would have been followed if the regime did not exist or different choices were made at the critical juncture. There are several areas of questioning that can be explored. If the regime did not exist how would policies actually effecting the

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[201] ibid., p.311.
[202] ibid., p.294.
[203] ibid. See also Olav Schram Stokke and Davor Vidas, op. cit., p.17.
[204] Robert O. Keohane, Peter M. Haas, and Marc A. Levy, "The Effectiveness of International Environmental Institutions", in Peter M. Haas, Robert O. Keohane, and Marc A. Levy (eds), *Institutions for the Earth: Sources of Effective International Environmental Protection*, MIT Press: Cambridge, Mass., 1993, p.19.
[205] Marc A. Levy, Oran R. Young, and Michael Zürn, op. cit., p.293.

environment have been different? If the regime had been different how would policies effecting the environment have been different? What feasible regime arrangements could be imagined that could have produced more effective policy in the issue area? This will involve a close account of the details of how each outcome came about. This may highlight the role of individual mechanics for compliance, and demonstrate any learning that may have happened.[206]

Transparency as a determinant of effectiveness

Transparency is a crucial factor in the effectiveness of regimes and promoting transparency is one of the most important functions of regimes.[207] Transparency is an elusive concept, but it can be used to refer to the availability of regime-relevant information, and the openness of a regime and its decision-making procedures to external observers. Transparency varies across different regimes, within regimes, and over time. The information provided by transparency about the issue area that a regime is concerned can be used for a variety of purposes. Information on the state of the environment and on the impact of regulated activities can facilitate coordinated action by the supporters of a regime. It allows reciprocity by providing reassurances about cheating, or by detecting evasion it can act as a primer for sanctions. It provides the informational basis for revision of the rules and norms of the regime. In summary transparency facilitates compliance, effectiveness and the ability to assess both.[208] The opaque nature of regimes can lead to attenuated accountability.[209]

Ronald B Mitchell categorises the information supply systems of regimes into three categories: self-reporting, other reporting, and problem reporting.[210] Self-reporting is information provided by an actor on its own behaviour. Self-reporting of information relies on the support of the actors targeted by the regime. If support declines, or demands increase, then the quantity and quality of self-reporting may decline. Other-reporting is information provided by an actor on other actor's behaviour. This information is most

[206] Olav Schram Stokke and Davor Vidas, op. cit., p.18.
[207] Ronald B. Mitchell, "Sources of Transparency: Information Systems in International Regimes", *International Studies Quarterly*, 42, 1998, pp.109-130. See also Abram Chayes and Antonia H. Chayes, "International Regulatory Regimes", in J. Tuchman Mathews (ed), *Preserving the Global Environment: The Challenge of Shared Leadership*, W.W. Norton: New York, 1991, pp.290 passim.
[208] Ronald B. Mitchell, op. cit., p.111.
[209] Robert O. Keohane and Joseph S. Nye, op. cit., p.262.

likely to be provided by an actor that is a victim of the behaviour concerned, or of an actor that is supportive of regime norms. The information can only be provided where the capacity exists for the information to be collected. If behaviour and impact can be concealed then other-reporting is difficult. Problem reporting is information on the effects of behaviours and nonbehavioural aspects of the problem. It focuses on the state of the problem.

Increasing transparency is generally assumed to equate to increased effectiveness for a regime, although this is not always the case. Some degree of diplomatic secrecy is required for negotiations to succeed and too much transparency may inhibit cooperation. Transparency may also be traded off in favour of other objectives of the regime. The types of actors involved may also influence the ability of a regime to create transparency, regimes with liberal democracies will probably be more transparent.[211] Effectiveness-oriented transparency focuses on how well the actors are collectively doing at achieving regime goals. Compliance-oriented transparency focuses on how well individual actors are doing at fulfilling regime commitments. There are demanding standards of evidence that must be met before regime rule violation can trigger a sanctioning response. Political dynamics mean that many regimes "end up with fundamentally effectiveness-oriented information systems."[212] This has generally been the case with the ATS regime, which has few rules for sanctioning deviant behaviour among its members. In judging how well the CCAMLR regime does in terms of effectiveness-oriented performance the question is does CCAMLR produce prompt, high quality, accurate information of the behaviours and problems it seeks to remedy? There is a possibility that as a regime matures pressure will develop for compliance-oriented transparency in addition to effectiveness-oriented transparency.[213]

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[210] Ronald B. Mitchell, op. cit., pp.116-123.
[211] ibid., p.113.
[212] ibid.
[213] ibid., p.115.

Robustness as a determinant of effectiveness

The effectiveness of an international regime is affected by the robustness of the social-choice mechanisms that it uses.[214] For example, the 'law of capture' is an established social choice mechanism for high seas fishing that means whoever is the first to capture a fish is now the owner of that fish. The procedures used for arriving at social choices can vary in two different dimensions. One dimension is that of robustness and fragility. "A social-choice mechanism is robust, in contrast to fragile, to the extent that is it can [sic] withstand perturbations or disruptive occurrences arising in conjunction with the activities it governs."[215] The second dimension is that of robustness and brittleness: "the robustness, in contrast to brittleness, of social choice mechanisms is a matter of their capacity to adjust to changes or disturbances occurring in the broader social environment without undergoing radical transformation."[216]

These two dimensions do not always match up. Robustness in a regime may be temporary, after gaining robustness there may be a period of stability after which problems may cause a regime to decline. A regime can not remain effective without the in-built capacity for change. Factors that might affect robustness include: changing membership, changing economic conditions, and new technology. Excessively brittle or fragile regimes can not be effective. This gives a wide framework of questions to be investigated. Are the ATS and CCAMLR regimes robust, brittle, or fragile? What broader changes in the social environment might impinge on the effectiveness of those regimes? Are they too brittle or too fragile?

Transformation rules as a determinant of effectiveness

The robustness of a regime can be linked with the regime's transformation rules. A regime that can change its rules and procedures in response to problems or broader social changes is more likely to be robust than a regime that can not change its rules. It is not as easy to alter the rules of international regimes as it is to make changes in a domestic situation.

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[214] Young, Oran R., "The Effectiveness of International Institutions: Hard Cases and Critical Variables", in James N Rosenau, and Ernst-Otto Czempiel (eds), *Governance Without Government: Order and Change in World Politics*, Cambridge University Press: Cambridge, 1992, pp.178-180. See also Andreas Hasenclever, Peter Mayer, and Volker Rittberger, op. cit., p.178.
[215] Oran R. Young, op. cit., p.179.
[216] ibid.

When change does occur it tends to be far reaching and may appear to occur suddenly.[217] The defection by France and Australia from CRAMRA and the subsequent negotiation of the Madrid Protocol happened over a relatively short period, but the pressure from environmental NGOs against CRAMRA had been in place since the beginning of negotiations. Change in a domestic setting tends to be more gradual and continuous. Some regimes, such as the UN, have their own legislative mechanisms, and legislative conferences exist as an *ad hoc* measure. In the ATS regime there exists the possibility of a review conference for the Antarctic Treaty at any time from thirty years after the Antarctic Treaty entered force, although this option has not been exercised. The Madrid Protocol incorporates a fifty year review period. CCAMLR does not have a specified review conference provision and must rely on its own decision-making procedures to change its rules. In an extreme situation an entirely new treaty could always be negotiated by the ATCPs if CCAMLR was considered a failure.

A well designed regime may have more stringent transformation rules that will increase the effectiveness of the regime. However, unless "it is easy to violate the dictates of existing institutions with impunity, conditions that make it hard to restructure or replace institutional arrangements will contribute to their effectiveness."[218] The rules of the ATS regime have often been violated by its members,[219] but in theory the consensus system leads to rules and conservation measures that are supported by all the members, and that this will increase the rate of compliance with the rules. The disadvantage is that this makes the regime resistant to change because it is very easy for regime members to impede change if they do not find the change to be in their interests. The ATS regime consensus decision-making procedure is unlikely to be changed. Only an acute paralysis in decision-making could lead to that substantial a change. A regime could be called an 'evolutionary regime' if it has a decision-making procedure that allows it to revise rules, thus fostering learning and problem solving.[220] Static regimes may prove brittle in the face of external change.

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[217] ibid., p.181.
[218] ibid.
[219] See Chapter 5, pp.190-192, for examples of violations of CCAMLR rules by CCAMLR member nationals.
[220] Marc A. Levy, Oran R. Young, and Michael Zürn, op. cit., p.278.

Capacity of governments as a determinant of effectiveness

International regime effectiveness varies with the capacity of the member governments to implement regime provisions.[221] International regimes require action by their members to implement provisions within their jurisdiction and to comply with the relevant rules. This includes making and enforcing laws, as well as making sure that civil society actors are able to take part in policy making and implementation.[222] There are many factors that limit their ability to do so, such as resource constraints, interest group politics, and non-market failures.

Resource constraints limiting the capacity to govern exist on all states, especially developing countries, so that there is often a large gap between the ideal implementation required and the actuality that is achieved. This means that effective regimes may be those with "clear-cut rules calling for action on the part of a small number of actors whose behavior is easy to monitor."[223] The patterns of interest are always affected when an international regime seeks to change existing behaviour. Some sets of interest may be affected negatively, others may be affected positively.[224] Interest group politics affects the capacity of governments after the negotiations phase is over by shifting their efforts to blocking the implementation of a regime's provisions in the domestic context. Non-market failures are a political counterpart of market failures. Using incentive systems rather than command-and-control regulations to channel behaviour may be as valid for international regimes as for domestic situations.[225]

A government that lacks the capacity to comply with the provisions of a regime is unlikely to be in a position to exercise leadership within that regime. Regimes usually require leadership from some of the members to be effective. Large numbers of low-capacity members may cause an institution to fail.[226] Does CCAMLR have a high proportion of low-capacity members? Regimes can act to foster the transfer of information, skills, and expertise that will allow member capacity to be increased. Some regimes act as a conduit

[221] Oran R. Young, op. cit., p.183.
[222] Robert O. Keohane, Peter M. Haas, and Marc A. Levy, op. cit., p.20.
[223] Oran R. Young, op. cit., p.184.
[224] Marc A. Levy, Oran R. Young, and Michael Zürn, op. cit., p.295.
[225] Oran R. Young, op. cit., p.185.
[226] Marc A. Levy, Oran R. Young, and Michael Zürn, op. cit., p.297.

for financial support.[227] This is not especially relevant to the ATS regime as it is largely funded to only cover its operating costs.[228] What efforts, if any, is CCAMLR making in this direction?

Distribution of power as a determinant of effectiveness

The effectiveness of an international regime can be circumscribed by asymmetry in the distribution of material power among its members.[229] When the powerful members are less constrained this can produce a class system that is coercive of the weaker members. Asymmetry creates a power elite that can impose a regime on the actors involved in an issue area, but the effectiveness of the regime is reduced if the powerful actors will be in a position to ignore the regime. Because this may increase compliance from the weaker members the circumscription does not necessarily make the regime less effective.[230] Where the distribution of power is more symmetrical it is harder to establish a regime, but the regime may be more effective once established.[231] An optimal level of distribution of material power has enough asymmetry to allow one or more actors to take a leadership role in establishing or maintaining a regime.[232]

The distribution of material power can affect a regime's ability to bring about behavioural change. For example, the United States has used fishing quotas in its EEZ as a power resource to promote compliance with IWC quotas.[233] It is worth noting that "coercive power by itself is no guarantee of success; it must be concentrated among proponents of institutional objectives."[234] One strand of hegemonic stability theory suggests that a concentration of power in a state is virtually a necessary condition for institutional success. The enforcer prevents 'free riding', especially in a situation like marine fisheries where there are incentives to defect because of the problem of the tragedy of the commons.

It will be difficult to establish whether or not material power plays a role in the decision-making processes of the CCAMLR sub-regime, and in eventual compliance with the rules

[227] Robert O. Keohane, Peter M. Haas, and Marc A. Levy, op. cit., p.23.
[228] See Chapter 4, pp.116-117 for details on CCAMLR funding.
[229] Oran R. Young, op. cit.
[230] ibid., p.186.
[231] ibid.
[232] ibid. p.187.
[233] Marc A. Levy, Oran R. Young, and Michael Zürn, op. cit., p.296.

promulgated by the CCAMLR Commission. The key members to investigate would be the United States, which appears to have played a key role in pushing forward the Catch Documentation Scheme (CDS) in attempting to deal with the IUU fishing problem, and those states which have been most involved in IUU fishing activities, such as Chile, Norway, and Spain. In addition, what other members are acting as leaders in attempting to resolve the problems? Do the powerful members of the CCAMLR sub-regime support its objectives? How does material power compare with 'epistemic power' in the ATS regime?

Interdependence as a determinant of effectiveness

The effectiveness of an international regime can vary directly with the level of interdependence among the actors involved.[235] Interdependence is an elusive concept, one definition of interdependence holds that "Interdependence arises when the actions of individual members of a social system impact ... the welfare of other members of the system."[236] Members of international society will have differing ratios of internal to external dependencies. A high internal ratio means a preoccupation with domestic affairs. A rising external ratio leads to a state of interdependence with other members of international society. Interdependence has been increasing since the Second World War. This trend seems unlikely to reverse in the foreseeable future, so international regimes are unlikely to be a temporary aberration in international relations.

Interdependence creates incentives to create and comply with regimes. First, "the behavior of the members of an interdependent system generates reciprocal side-effects or externalities that individual members can not ignore as they pursue their own interests."[237] The ATS regime is in part a result of the interdependence of the state actors who had developed an interest in Antarctica and were unable to achieve their objectives through unilateral actions. Second, the "growth of interdependence also contributes to the effectiveness of institutional arrangements by enhancing the capacity of each member of the social system to retaliate for the infractions of others."[238] Regimes control mutual interference and make behaviour predictable. They also provide forms of social pressure to

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[234] ibid.
[235] Oran R. Young, op. cit., p.188.
[236] ibid.
[237] ibid., p.189.
[238] ibid.

use against rule violators.[239] Within the ATS regime social pressure has normally been kept within the margins of meetings, although environmental NGOs will also apply public pressure. Some questions that can be framed from this include: how interdependent are the members of the ATS regime? Is the increasing interdependence likely to result in a more effective regime for CCAMLR?

Nature of the issue area as a determinant of effectiveness

Some international regimes may be more effective because they operate in a relatively benign issue area.[240] The ATS regime operates in an issue area that presents some significant challenges. The sheer size of the space it encompasses and the harsh geography and climate of the Antarctic region requires significant government capacity to operate safely in the region. The territorial sovereignty problem increases the ambiguity of many norms and rules. Considerable uncertainty exists about some of fundamental scientific concerns in Antarctica and the Southern Ocean, such as what affect 'global warming' will have, and the nature of the ecosystem of the Southern Ocean These factors can all help prevent implementing effective solutions to problems. Problems can be marked by unambiguous shocks or crises, or may be firmly established on the international agenda. Lack of early warnings and time lags between decision-making and implementation can prevent effective reaction to a problem: "time-lags often delay the emergence of crisis until [fishery] stocks have been drawn down so low that no effective institutional responses are available."[241] To what extent was the IUU problem an unambiguous crisis for the CCAMLR sub-regime? How long did it take for CCAMLR to develop an effective reaction to the IUU problem?

Intellectual order as a determinant of effectiveness

The effectiveness of international regimes will vary with the strength of the intellectual order that supports it. Regimes are expressions of cognitive constructs designed and spread by human beings. "International institutions cannot remain effective for long after the erosion or collapse of their intellectual substructures."[242] If a new system of ideas appears

[239] ibid., pp.189-190.
[240] Marc A. Levy, Oran R. Young, and Michael Zürn, op. cit., p.297.
[241] ibid., p.298.
[242] Oran R. Young, op. cit., p.190.

it will put pressure on a regime to transform. If a system of ideas has collapsed and there is no new cognitive framework, then there can be a period of protracted ambiguity when there are no rules in place to guide actions. One important idea in international relations is the concept of the sovereign state. This concept can be seen as being undermined by the effect of increasing interdependence or it can be seen as responding by changing its nature. While states persist in retaining formal sovereignty, they now permit "their *operational sovereignty* – their legal freedom of action under international law – to be eroded"[243] in order to get the outcomes they desire. This is a point relevant to the ATS and the compromise on sovereignty issues in the Antarctic region.

It is difficult to document broad framework world views, but not impossible for regimes with regional or functional issues.[244] The ideas that underpin the ATS regime are expressed in the principles and norms that underlie it. These ideas have been challenged in the past by new systems of ideas, such as the common heritage principle, and the ATS regime has modified its system of ideas in order to remain effective. One of the principles underlying the CCAMLR sub-regime has been that of 'rational use' of the marine resources of the Southern Ocean. This principle is being challenged by the environmental NGOs that support a moratorium as the most effective method for preserving the Patagonian toothfish and the related ecosystem of the Southern Ocean. It will be interesting to see how this issue progresses and what impact it will have on the CCAMLR sub-regime as it could cause an argument between conservation minded members and those that favour harvesting.

Epistemic community methodology

Investigating epistemic communities is one way of analysing change in the intellectual order of a regime.[245] According to Peter Haas the way to demonstrate the impact of an epistemic community on policymaking involves the following:

> With respect to a specific community, they involve identifying community membership, determining the community members' principled and causal beliefs, tracing their activities and demonstrating their influence on decision makers at

[243] Marc A. Levy, Robert O. Keohane, and Peter M. Haas, "Improving the Effectiveness of International Environmental Institutions", in Peter M. Haas, Robert O. Keohane, and Marc A. Levy (eds), *Institutions for the Earth: Sources of Effective International Environmental Protection*, MIT Press: Cambridge, Mass., 1993, p.416. Emphasis in original.
[244] Oran R. Young, op. cit., p.191.
[245] See pp.31-37 above for an introduction to epistemic community theory and its problems.

> various points in time, identifying alternative credible outcomes that were foreclosed as a result of their influence, and exploring alternative explanations for the actions of decision makers.[246]

Before an epistemic community can be analysed for its contribution towards the effectiveness of CCAMLR such a community must first be clearly identified. There may be more than one epistemic community present within CCAMLR. Care has to be taken in distinguishing the epistemic community from other groups. The factors outlined by Haas can be used here in an effort to understand the role that epistemic communities may have played in the decision-making of the CCAMLR regime.

The initial assumption is that the Scientific Committee will be the core membership for an epistemic community in CCAMLR. Associated to this are Scientific Observers included in national delegations to the Commission. The Commission is the decision making body, but the decisions are made by individual states. It will be interesting to see if consensus at the Scientific Committee level leads to consensus at the Commission level and how this is affected by bargaining. What happens before and after the emergence or persistence of the epistemic communities influence? Has the epistemic community, or communities, been a significant factor in relation to IUU fishing? Has it contributed to regime effectiveness or regime learning? Oran Young warned of the possibility of *post hoc ergo propter hoc* reasoning, finding an epistemic community when there is success, and failing to find an epistemic community when there is failure.[247] Is CCAMLR currently a case of an epistemic community that is failing in respect of the IUU problems?

Regime change methodology

The approach recommended by Keohane and Nye is to seek explanations with simple models, and add complexity later.[248] The approach here will be to start with the economic process model and then add the other models.[249] The different models may apply well or poorly at different times and conditions. The economic process model predicts that regime change will be based on technological change and growing economic interdependence.

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[246] Peter M. Haas, "Introduction: Epistemic Communities and International Policy Coordination", *International Organization*, 46 (1), 1992, p.34.
[247] Oran R. Young, *International Governance: Protecting the Environment in a Stateless Society*, Cornell University Press: Ithaca, 1994, pp.96-97.
[248] Robert O. Keohane and Joseph S. Nye, op. cit, pp.50-52.
[249] See Chapter 2, pp.37-40.

What are the technological changes affecting CCAMLR? This model predicts that CCAMLR will be undermined by change, but will not disintegrate. The politics of the issue will resolve around adjusting to a new equilibrium introduced by technological and economic change. The overall power structure model is less useful, but predicts congruence between issues. Do the powerful actors in CCAMLR create linkage on issues on which they are in weak positions? The issue structure approach holds that in an issue area power resources related to vulnerability will dominate resources relevant to sensitivity within a regime, and predicts that where contrary outcomes occur powerful states will force changes in the regime. The international organisation model can be used to help explain how CCAMLR has an inertial force that allows it to persist, by examining how some states benefit from its norms, networks, and institutions.

There are no well-tested empirical generalisations to explain how and why regimes change. Theories of regime change need to incorporate how domestic politics and international regimes influence each other.[250] This is required if the reasons for states' preferences changing are to be understood. Structural theory remains useful, as self-interest can be consistent with regime formation and maintenance.[251] Regimes can survive changes in power distribution, which means that explanations for regime change are unlikely to be simple.[252] This might occur because although establishing regimes can be difficult, maintaining them may be easier. Regimes can survive a deterioration of relations between its participants. For example, during the Falkland/Malvinas Islands War between Argentina and the United Kingdom both parties continued to engage in ATS negotiations.[253] Regimes can survive an apparent failure to solve a problem if they are 'evolutionary' or 'dynamic'. "If a regime seems too weak as initially constituted to achieve its institutional goals ... this may trigger a dynamic leading to a strengthening of the regime itself."[254] A fundamental shift in domestic politics could also change a party's international interests. Regimes may be unable to survive the loss of key members, and the ATS or CCAMLR would experience difficulty if any of the territorial claimants found that the regime was no longer worth complying with.

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[250] ibid., p.279.
[251] ibid., p.280.
[252] Marc A. Levy, Oran R. Young, and Michael Zürn, op. cit., "Some regimes acquire a life of their own and remain intact long after the forces that produced them have dissipated or shifted to other issues. In other cases, regimes that have proved effective for relatively long periods collapse quickly as circumstances (often, but not always, involving technological developments) change."
[253] See Chapter 3, note 61, p.66.
[254] ibid., p.290.

Summary

This thesis will attempt to apply the theory of regimes to the case study. It will be a consolidation and refinement rather than an attempt to bring regime theory to a new level. The next three chapters will outline the case study, with the bulk of the analysis of the case study taking place in chapter 6. Analysing changes in CCAMLR conservation measures and other rules will show outputs and the impacts on IUU fishing and sea-bird by-catch. This will enable an assessment of outcomes and behaviour shaping to be made. One area of investigation relevant here is the extent to which rules are being complied with, and the significance of any changes to the CCAMLR rules. If CCAMLR is being effective in these areas then it should continue to survive without becoming a 'dead letter' regime.

CHAPTER 3

Background to the ATS and CCAMLR

This chapter will cover several background topics. The geography of Antarctica and the Southern Ocean will be detailed. Then, the initial political development of Antarctica will be summarised, from discovery and exploration through to territorial claims and the foundation of the ATS. The development of the main instruments of the ATS and their impact on the Southern Ocean will be dealt with briefly. The impact of sovereignty issues on the environment will be explored. Global macro-trends which impinge on the environment will then be summarised and the relevant international regimes covered. Actual marine exploitation of whales, krill, and finfish species before CCAMLR was created will be covered.

Geography: The Southern Ocean and Antarctica

The waters around Antarctica have been variously called the Antarctic, Southern, or South Polar Seas.[1] In 2000 the International Hydrographic Organisation delimited a fifth world ocean from the southern portions of the Atlantic, Indian, and Pacific Oceans. The Southern Ocean extends from the coast of Antarctica north to 60° South latitude. This makes the Southern Ocean the fourth-largest of the world's five oceans.[2] The Southern Ocean also has a distinct boundary based on the convergence of cold water from the south with warm water from the north. The convergence between Antarctic and Sub-Antarctic waters is up to 50 kilometres wide at points and fluctuates between 50° and 62° South latitude.[3] It acts as an ecosystem boundary for many species, especially krill. This convergence cuts across

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[1] Mahinda Harischandra Parera, *Change and Continuity in Antarctic Environmental Protection: Politics and Policy*, PhD Thesis, Dalhousie University, 1995, p.162. Argentina used the plural Southern Oceans in an attempt to bolster their sovereignty claim. R. Tucker Scully, "Institutionalisation of the Antarctic Treaty Regime", in Wolfrum, Rüdiger (ed), Klaus Bockslaff and Ingrid L. Jahn (asst. eds), *Antarctic Challenge II: Conflicting Interests, Cooperation, Environmental Protection, Economic Development: Proceedings of an Interdisciplinary Symposium September 17th-21st 1985,* Duncker & Humblot: Berlin, 1986, p.283, mentions an early International Oceanographic Commission debate over the definition of the term Southern Ocean which became so complex and heated that further discussion of the term was dropped.

[2] CIA, The World Factbook 2000, Southern Ocean, http://www.odci.gov/cia/publications/factbook/geos/oo.htm (last accessed 11 October 2000).

[3] Christoper C. Joyner, *Governing the Frozen Commons: The Antarctic Regime and Environmental Protection*, University of South Carolina Press: Columbia, South Carolina ,1998, p.2.

some of the regional fish stocks, and a more definitive boundary is the convergence of the Sub-Antarctic and sub-tropical waters, giving an absolute northern periphery for the Southern Ocean around 40° South latitude. Where the cold water sinks and the warm water rises, the sea is exceptionally rich in nutrients, and the Southern Ocean is abundant with marine life, especially fish, whales, seals, krill, and penguins. This marine life has attracted economic interest since humans first entered the region.[4]

Including the waters up to the sub-tropical convergence, Antarctica's circumjacent ocean has an area of approximately 36 million square kilometres, about 10% of all the world's oceans.[5] The Southern Ocean acts as a major heat sink for the world. The Antarctic Circumpolar Current, which flows from west to east around Antarctica, and it is impeded only by the Drake Passage, the greatest ocean current in the world.[6] It moves about twice the volume of water as the Gulf Stream, and has a width varying from 200 to more than 1,000 kilometres.[7] The Southern Ocean also has semi-permanent, drifting ice packs, which expand and contract with the passing seasons. The sea ice around Antarctica varies from up to 19 million square kilometres in area during winter to a minimum of 2.6 million square kilometres in summer.[8]

The Southern Ocean consists of a system of deep basins separated by three large mid-oceanic ridges, the Macquarie Ridge south of New Zealand and Tasmania; the Kerguelen-Gaussberg Ridge at about 80° East longitude, and the Scotia Ridge extending from the southern Patagonian shelf in an eastward arc to the South Shetland Islands and the Antarctic Peninsula. The continental shelf is narrow, except in parts of the Weddell, Ross, Amundsen, and Bellingshausen Seas.[9]

The Southern Ocean can not be considered without taking into account the influence that the continent of Antarctica has on it. Where the Arctic is an ocean surrounded by

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[4] J.C. Beaglehole (ed.), *Journals of Captain James Cook on His Voyages of Discovery: The Voyage of the Resolution and the Adventure 1772-1775*, Cambridge University Press: Cambridge, 1974, pp.427-430. Mention is made of seals, whales, penguins, and birds in Cook's journals, and how seal blubber could be turned into oil.

[5] The ATS boundary of 60°South latitude contains only 20.327 million square kilometers.

[6] Parera, op. cit., p.158. CIA, op. cit., the current transports 130 million cubic meters of water per second, and is approximately 21,000 kilometres in length.

[7] Christopher C. Joyner, *Antarctica and the Law of the Sea*, Martinus Nijhoff Publishers: Dordrecht, 1992, pp.21-22.

[8] F. M. Auburn, *Antarctic Law and Politics*, C. Hurst & Co. (Publishers) Ltd: London, 1982, p.1.

[9] Karl-Hermann Kock, *Understanding CCAMLR's Approach to Management*, May 2000, p.1.

continental land masses, the Antarctic is a continent surrounded by the Southern Ocean. Antarctica is an isolated continent: South America 1,000 kilometres away is the nearest other significant land mass, while the distance from McMurdo Base to Christchurch in New Zealand is approximately 3,000 kilometres.[10] It was the last continent to be discovered and is without indigenous inhabitants. It is largely an ice-covered wilderness, although 2% is barren rock, and 11% is made up of the floating ice shelves that are unique to Antarctica. Glaciers form these ice shelves along part of the coastline of 30,010 kilometres.[11] The weight of the massive polar ice sheet, which can have a thickness of up to 4,500 meters (although the average thickness is around 2,000 meters), is enough in places to depress the Antarctic rock level 200-300 meters.[12] While Antarctica has an average elevation of 1,850 meters, without the ice sheet it would average only 500 meters.[13] Antarctica is the fifth-largest continent, with an area of 14.2 million square kilometres, about the size of the United States and Europe combined.[14]

Despite the snow and ice, Antarctica is a very arid place, a 'white' or 'crystal' desert that has approximately 90% of the world's ice and three-quarters of its fresh water locked up in the ice cap that covers the continent. Precipitation in the interior averages 3-5 centimetres per year. Antarctic temperatures are comparable to those on the planet Mars,[15] with a temperature of -128.6°F being measured at Vostok Station on July 21, 1983. The cold is exacerbated by the gravity driven katabatic winds blown coastward from the interior, which often reach 90 miles per hour at the coast.[16] Although the Southern Ocean has substantial marine life, the continent of Antarctica is almost free of flora and fauna. What flora and fauna there is, lies concentrated along the coastline and the warmer Antarctic peninsula. Antarctica is the coldest, windiest, highest, driest, least accessible, and most inhospitable continent on Earth.

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[10] Auburn, F. M., op. cit., p.1.
[11] Christoper C. Joyner, *Governing the Frozen Commons: The Antarctic Regime and Environmental Protection*, University of South Carolina Press: Columbia, South Carolina 1998, p.3.
[12] ibid, p.6.
[13] ibid, p.4.
[14] ibid, p.3.
[15] P.W. Quigg, *A Pole Apart: The Emerging Issue of Antarctica*, McGraw-Hill Book Company: New York, 1983, p.34.
[16] Christoper C. Joyner, op. cit., pp.4-5.

History: the Southern Ocean and Antarctica until 1959

Discovery and exploration

Although Captain James Cook destroyed the myth of a temperate habitable land in the Southern Ocean while circumnavigating Antarctica in 1772-75, he never claimed to have seen the continent of Antarctica.[17] In 1773, Cook opined: "I can be bold enough to say that no man will ever venture further than I have done and that the land which may lie to the south will never be explored."[18] Captain Cook's journal contained descriptions of the marine life of the Southern Ocean, especially reports of the whales and seals that were to attract commercial interest in the region in subsequent years. The discovery of Antarctica probably occurred during 1820-21, with three claimants to the first sighting of the continent, one British (Edward Bransfield), one Russian (Fabian von Bellingshausen), and one American (Nathaniel Palmer).[19] At this stage it was not yet clear that Antarctica was a continent, and not a group of islands. The claim to have made the first landing on the actual continent is also contested.

Early exploration of Antarctica was to some extent a by-product of sealing.[20] Expeditions to the Sub-Antarctic in pursuit of fur and elephant seals (for their fur and oil respectively) had begun in 1770.[21] Between 1790 and 1822, 129 British and American sealing voyages were recorded, 119 of them between 1820 and 1822.[22] With these sealing ventures came the discovery of many islands and portions of the coastline of Antarctica. These included the 1823 discovery of the Weddell Sea by the sealer James Weddell, and the 1825 discovery of Graham Land, the southern extension of the Antarctic Peninsula. By 1830, the slaughter of seals had progressed to the point where sealing was no longer commercially viable, and some of the seal species were close to extinction.

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[17] P.W. Quigg, op. cit., p.8. Cook did, however, venture the opinion that there might be a tract of land responsible for the ice that impeded his voyage. See J.C. Beaglehole op. cit., p.431.
[18] ibid, p.431.
[19] The relative merits of these claims are discussed in P.W. Quigg, op. cit., pp.10-13.
[20] P. J. Beck, *The International Politics of Antarctica*, Croom Helm Ltd: London, 1986, p.24.
[21] Christopher C. Joyner, *Antarctica and the Law of the Sea*, Martinus Nijhoff Publishers: Dordrecht, 1992, p.29.
[22] ibid, p.4.

After the sealers largely had quit the region, there were three major scientific expeditions in search of the south magnetic pole carried out during 1838-1843.[23] The French explorer Dumont D'Urville landed on the portion of the continent now known as Terre Adélie (or Adélie Land) and claimed the region for France. Lt. Charles Wilkes of the US Navy sailed along the East Antarctic Coast and recognised that a continental land mass probably existed. The British explorer James Clark Ross penetrated the ice pack in 1840 to discover the Ross Sea and the Ross Ice Shelf.[24] Apart from these expeditions, there was no immediate follow up of the discovery of Antarctica for almost five decades.

Attention returned to Antarctica with the 'heroic' age of exploration of the continent. This was prompted in part by the 1895 International Geographical Congress, which noted that Antarctica was in need of research and exploration.[25] In 1897-98, a Belgian expedition was the first to winter over in Antarctica, when their ship, the *Belgica*, was trapped by ice in the Bellingshausen Sea. Numerous other expeditions followed. This heroic era was best typified by the race for the South Pole between Commander Robert F. Scott of Britain and the Norwegian explorer Roald Amundsen in 1911-12. Amundsen reached the Pole on December 11, 1911, Scott on January 17, 1912. Scott's failure and death on the return journey have helped to create images of Antarctica as a barren wilderness. One account of this expedition was titled 'The Worst Journey In The World'.[26] The heroic era is generally reckoned to have ended with Ernest Shackleton's 1914 expedition. Important trends had been established for the future during this era. The expeditions conducted science, and the resulting information was freely shared with anyone who was interested.

Accompanying the new era of exploration in Antarctica came renewed commercial interest. Changes in technology, such as steam power and the harpoon gun, allowed exploitation of species of whales, such as the Blue or Fin whales, that had previously been largely immune to attempts at harvesting. New uses for whale products were also developed in the decade before the First World War, such as in margarine when the process of hydrogenation allowed whale oil to be turned into fat.[27] Soap by-products were

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[23] The south magnetic pole was finally reached by Egdeworth David on January 16, 1909. P.W. Quigg, op. cit., p.24.
[24] Christopher C. Joyner, op. cit. pp.5-6.
[25] P. J. Beck, op. cit., p.25.
[26] One expedition member later said that "the trenches at Ypres were a comparative picnic." Apsley Cherry-Garrard, *The Worst Journey in the World : Antarctic, 1910-1913*, Chatto & Windus: London, 1937, xvi.
[27] Gordon Jackson, *The British Whaling Trade*, A&C Black Limited: London, 1978, pp.178-181.

used as a source of glycerol for explosives, making whaling a strategic industry.[28] From the turn of the century, whaling was the dominant industry of the region; there were nineteen firms involved by 1914.[29] Whaling started from shore-based stations in islands, but in the late 1920s Pelagic Factory ships were developed which allowed whaling throughout the Southern Ocean. Within twenty years after the Second World War, the last whale stocks were exhausted.[30] In 1982, the International Whaling Commission (IWC) reduced the commercial catch limit for whales to zero,[31] and in 1994 it adopted a Southern Ocean sanctuary.[32]

The era of imperialism

Despite the image of a barren wilderness, territorial claims in Antarctica were advanced in a haphazard way, leaving a set of unresolved disputes and hidden tensions which persist to this day. The United Kingdom did attempt to 'paint the continent red' at one stage, but this was prevented by states outside the British Empire making claims.[33] Argentina, Australia, Chile, France, New Zealand, Norway, and the United Kingdom all claimed part of Antarctica sometime between 1908 and the 1940s.[34] Only Australia, France, New Zealand, Norway and the United Kingdom mutually recognise each others' claims.

During the 1930s there was not much scientific activity in Antarctica due to the depressed economic conditions. During the Second World War German raiders were active in the Southern Ocean in 1941, and the British responded with *Operation Tabarin.* This established a permanent British presence in Antarctica.[35] After the war, major interest in the continent resumed with the United States 1946-47 expedition, *Operation Highjump,*

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[28] ibid, p.176.
[29] ibid, p.172. The firms involved were mostly Norwegian and British companies.
[30] ibid, p.257. J.A. Gulland summarises the development of the IWC in "The Management Regime for Living Resources", in Christopher C. Joyner, and Sudhir K. Chopra (eds), *The Antarctic Legal Regime*, Martinus Nijhoff Publishers: Dordrecht, 1988, 1998, pp.224-227.
[31] http://ourworld.compuserve.com/homepages/iwcoffice/Schedule.htm#PARA10e (site visited on 14 January, 2000).
[32] This sanctuary comprises the waters of the Southern Hemisphere southwards of the following line: starting from 40°S, 50°W; thence due east to 20°E; thence due south to 55°S; thence due east to 130°E; thence due north to 40°S; thence due east to 130°W; thence due south to 60°S; thence due east to 50°W; thence due north to the point of beginning.
http://ourworld.compuserve.com/homepages/iwcoffice/Schedule.htm#PARA7SANCTURIES (visited on 14 January, 2000).
[33] P. J. Beck, op. cit., p.29.
[34] Emilio J. Sahurie, *The International Law of Antarctica*, New Haven Press: New Haven, 1992, pp.12-31. See also map of claims on p.x.

involving twelve ships, nine aircraft, and 4,700 men.[36] However, much of this resurgence in scientific activity was still linked to establishing and protecting territorial claims, and groups like the British Antarctic Survey (BAS) were government sponsored.

Other states, such as South Africa, Germany, and the United States have considered making claims in Antarctica.[37] Japan was interested in Antarctica, but is precluded by Article 2(e) of the Peace Treaty with Japan from making any claim there.[38] Only two sections of Antarctica remain unclaimed, Marie Byrd Land and an undefined sector between the Norwegian claim and the South Pole (about 15% of the continent). The United States developed a stance of non-recognition of the claims on the basis that effective occupation is a necessary requirement, while reserving their own right to make a claim in the future, which would be grounded on acts similar to those made by the existing claimants.[39] Marie Byrd Land was tacitly left by other states for the United States to claim, although this area is considered the least valuable part of Antarctica,[40] otherwise the United States would have to claim territory already claimed. Title would be more difficult to establish in an area with competing sovereignty claims. The Soviet Union (now the Russian Federation) does not recognise any national claims in Antarctica, and reserves rights based on Russian exploration and discovery, although they have no specified area of interest in the continent.[41]

Argentina, Chile, and the United Kingdom have contentious claims which overlap in the Antarctic Peninsula.[42] These disputes are also linked to the dispute over the Falkland/Malvinas Islands between Argentina and Britain, and a dispute over islands in the Beagle Channel between Argentina and Chile.[43] In 1949 a Tripartite Naval Agreement was made between Britain, Argentina, and Chile, that none of their naval vessels would go

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[35] P. J. Beck, op. cit., pp.31-33.
[36] ibid., p.37.
[37] For information on the proposed South African claim, see Clauses J. Dodds, 'South Africa and the Antarctic, 1920-1960', *Polar Record*, 32 (180), 1996, pp.25-42. German interest in Antarctica was curtailed by the outbreak of the Second World War, Emilio J. Sahurie, op. cit., p.52.
[38] ibid, p.46.
[39] ibid, pp.32-35. The position of the United States was first expressed by Secretary of State Hughes: "It is the considered opinion of this department that the discovery of lands unknown to civilization, even when coupled with formal taking of possession, does not support a valid claim of sovereignty, unless the discovery is followed by an actual settlement of the discovered country."
[40] ibid, p.35.
[41] Sahurie, Emilio J., op. cit., p.43.
[42] ibid, p.14. Britain claims 17% of Antarctica between 80°W and 20°W. Only 1% of this claim is undisputed, the remainder of the claim is also claimed by Argentina or Chile, or by both.

below 60° South latitude. This agreement reflected the growing political importance of Antarctica, and the desire of the parties to avoid a military confrontation and the fiscal cost of stationing military forces in the region.[44]

On 1 February 1952 a British party of scientists intent on rebuilding a base at Hope Bay had shots fired over their heads.[45] The incident was resolved diplomatically, but still represents the only time "shots were fired [in Antarctica] by one country against personnel from another power."[46] The unstable relationship between Britain, Argentina, and Chile was part of impetus for the negotiations that eventually led to the Antarctic Treaty. Attempts at resolving the territorial claims, either under UN trusteeship or as part of a condominium, were unsuccessful. On 7 June, 1950 there was a note from the Soviet government to the United States government and six of the seven claimant states declaring that any further discussion on the future of the Antarctic should not take place without Soviet involvement. This was because of the general Soviet policy that matters of international importance could not be negotiated without their participation.[47]

The IGY and the Antarctic Treaty

In 1950 it was suggested that a Third International Polar Year was needed to advance knowledge about Antarctica (the first two had been in 1882 and 1932).[48] This became the successful 1958 International Geophysics Year (IGY), held from 1 July 1957 to 31 December 1958. In 1957 the Scientific Committee on Antarctic Research (SCAR) was formed.[49] Twelve states were involved in the IGY and sent scientific expeditions to Antarctica. These were the seven territorial claimants, the United States, Belgium, Japan, South Africa, and the Soviet Union. Cooperation between expeditions was encouraged, the military was excluded except for a logistics support role, and the claimants agreed to refrain from trying to control access to claims.[50] A 'gentleman's agreement' was reached in 1955 to the effect that the IGY activities were without legal or political value in relation to

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[43] P. J. Beck, op. cit., p.85. This dispute was resolved with Papal assistance in 1984.
[44] ibid, pp.33-34. The agreement was renewed annually until the late 1950s.
[45] Peter J. Beck, 'A Cold War: Britain, Argentina, and Antarctica', *History Today*, p.16. June 1987.
[46] ibid, p.17.
[47] Emilio J. Sahurie, op. cit., p.42, (in note 234); Chile was excluded because there were no diplomatic relations between the two states at that time, and see also Lorraine M. Elliott, op. cit., p.29.
[48] P.W. Quigg, op. cit., pp.46-47.
[49] Emilio J. Sahurie, op. cit., p.181.
[50] Lorraine M. Elliott, op. cit., p.30.

the territorial claims.[51] The effectiveness of this agreement was mixed, and the positioning of a United States base at the South Pole and a Soviet base at the Pole of Inaccessibility (the point in the Antarctic continent furthest from the sea) had unsettling implications for the territorial claimants.[52] Both the United States and the Soviet Union were now established in Antarctica. The IGY was considered an important success, with many scientific discoveries, such as the Van Ellen radiation belts, and it "established scientific research as the currency of Antarctic politics".[53]

The success of the IGY, and its temporary nature, represented an opportunity to break the political impasse of the 1940s and 1950s, and the IGY was followed up with negotiations in Washington, after an invitation from United States President Eisenhower in May 1958. The Washington negotiations involved the twelve governments which had been involved in the IGY. The negotiations over the US proposal used principles that had first been suggested by Chile in the Escudero declaration of 1948.[54] Quick progress was made after initial Soviet stalling was overcome.[55] Preservation of the *status quo* was predominant because reaching a consensus agreement required compromising to the lowest common denominator. The benefits of international cooperation in Antarctica outweighed the costs of continued strategic rivalry in the region. Another motivating factor in favour of negotiations was a fear that the Cold War confrontation between the United States and the Soviet Union would be extended into Antarctica, or the costs of continued rivalry among the existing claimants.

The 1 December 1959 Antarctic Treaty managed to set aside the sovereignty issue for the time being, through a compromise in Articles IV and VIII that allowed all parties to retain their current position with respect to territorial claims in Antarctica. The Antarctic Treaty thus provided a *modus vivendi* that allowed everyone interested in the Antarctic to operate there. The Antarctic Treaty covered the area south of 60° South latitude.[56] The twelve IGY states became the first twelve Antarctic Treaty Consultative Parties (ATCPs).
Since the Antarctic Treaty entered into force on 23 June 1961, the Antarctic region has kept unmilitarised and largely free from conflict. This is in keeping with the view

[51] F. M. Auburn, op. cit., pp.89-93.
[52] Emiko J. Sahara, op. cit., p.180.
[53] F. M. Auburn, op. cit., p.93.
[54] ibid., p.86.
[55] P.W. Quigg, op. cit., pp.146-147.

expressed in the preamble to the Antarctic Treaty "that Antarctica shall continue forever to be used exclusively for peaceful purposes and shall not become the scene or object of international discord."[57] This principle was implemented in the first Article of the Treaty by requiring that:

> Antarctica shall be used for peaceful purposes only. There shall be prohibited, inter alia, any measure of a military nature, such as the establishment of military bases and fortifications, the carrying out of military manoeuvres, as well as the testing of any type of weapon.[58]

Military forces remained in Antarctica only in a logistic support role for scientific or other peaceful purposes.[59] The Antarctic Treaty also alleviated some nuclear fears by prohibiting nuclear explosions and the disposal of radioactive waste in Antarctica, making the region the first nuclear free area in the world.[60] The inclusion of rivals such as the United States and Soviet Union, or Argentina, Chile, and Britain, was a major achievement in 1959. One significant example of conflict prevention is that the Antarctic Treaty helped insulate Antarctica from the effects of the 1982 war between Argentina and the United Kingdom over the Falkland/Malvinas Islands.[61]

Articles VII and VIII established a system of observation and inspection, something which contributes to the effectiveness of the ATS.[62] The exchange of scientists provided for in Article III (1) offers an alternate informal method of observation.[63] Article XI provides a non-binding mechanism for resolving disputes among the Antarctic Treaty Parties (ATPs). In the first instance ATPs will attempt to resolve disputes between themselves, but if that is not possible then they can arbitrate the dispute through the International Court of Justice (ICJ).

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[56] Appendix I, Article VI.
[57] Appendix I, Preamble.
[58] Appendix I, Article I, (1).
[59] Appendix I, Article I, (2). "The present Treaty shall not prevent the use of military personnel or equipment for scientific research or for any other peaceful purpose." P. J. Beck, op. cit., pp.89-73 discusses some of the ambiguities and difficulties presented by this Article, but notes the general success achieved.
[60] Appendix I, Article V.
[61] P. J. Beck, *The International Politics of Antarctica*, Croom Helm Ltd: London, 1986, pp.83-85 During the war Argentinian and British representatives continued to sit down together in negotiations over Antarctic resources and a minerals regime.
[62] ibid., at pp.73-80, Beck comments on the inspection system, that it has its weaknesses and that "In practice, the much-vaunted inspection and observation system of Article VII has proved more apparent than real" at p.79.
[63] ibid., pp.79-80.

As well as the norm of peaceful cooperation, the Antarctic Treaty saw the establishment of the importance of science. Article II indicated a desire for the freedom of scientific investigation and cooperation of the IGY to continue. Article III established some of the procedures to be used to implement this principle, as does Article IX 1 (b) and (c). Some concern has been expressed that science in Antarctica has been a proxy for political action to maintain a position on territorial claims,[64] especially when scientific activities involve potential economic resources such as hydrocarbon reserves. One example of this politico-legal activity is how the funding to BAS was increased by over 60% after the 1982 conflict over the Falklands/Malvinas Islands.[65]

The Antarctic Treaty did not mean that Antarctica was internationalised, and membership of the ATS remained something of a private club for a long time. While the original twelve ATCPs will always retain consultative status, new members acceding under Article XIII[66] can only gain and retain consultative member status after demonstrating their interest "by conducting substantial research activity there, such as the establishment of a scientific station or the dispatch of a scientific expedition."[67] Real growth in membership did not occur until the 1980s, when the prospect of benefits from mineral resource exploitation proved attractive.[68] This rush to accession stopped with the ban on mineral resource activity in the Madrid Protocol.[69]

One problem in the original Antarctic Treaty was the failure to establish a secretariat to support the administration of the treaty. Although the concept of a secretariat for the Antarctic Treaty is now supported in principle, there is no consensus yet on where a secretariat should be located – although Buenos Aires seems to be the main contender.[70]

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[64] ibid., pp.130-134.
[65] ibid., p.131.
[66] Appendix I, Article XIII (1). "The present Treaty shall be subject to ratification by the signatory States. It shall be open for accession by any State which is a Member of the United Nations, or by any other State which may be invited to accede to the Treaty with the consent of all the Contracting Parties whose representatives are entitled to participate in the meetings provided for under Article IX of the Treaty."
[67] Appendix I, Article IX, (2).
[68] Lorraine M. Elliott, op. cit., p.123. Brazil and India, joined in January 1984, China and Uruguay from April 1985, German Democratic Republic and Italy from January 1988.
[69] Christoper C. Joyner, *Governing the Frozen Commons: The Antarctic Regime and Environmental Protection*, University of South Carolina Press: Columbia, South Carolina, 1998, p.164.
[70] Conversation with Dr. Jane Shearer 10 February 2000. There is an unstated rule in the ATS that the institutional headquarters should be spread between ATCPs. Australia has the CCAMLR Secretariat in Hobart, Tasmania. New Zealand would have had the CRAMRA Secretariat based in Wellington if CRAMA had entered into force. There is a definite feeling that it is the "South American turn" for an ATS Secretariat.

This has caused problems in administering the ATS, as hosting an ATCM is an expensive and time-consuming exercise for the host country.[71]

History: Development of the ATS from 1959

The subsequent development of the Antarctic Treaty System (ATS) has often been concerned with establishing regulations concerning the environment. It is appropriate to call it a 'system' because of the number of interlocking agreements that have been developed under the broad umbrella of the Antarctic Treaty. To a large extent, the ATS that developed out of the Antarctic Treaty has worked because it deals with the big issues, giving time and attention to resolving the problems which face Antarctica. One area that has developed significantly has been the interest in protecting the environment of Antarctica and the Southern Ocean.

Article IX provides the bulk of the institutional framework of the Antarctic Treaty, which has been built on through the ATCMs that have been held over the years. This article required meetings to be held:

> for the purpose of exchanging information, consulting together on matters of common interest pertaining to Antarctica, and formulating and considering, and recommending to their Governments, measures in furtherance of the principles and objectives of the Treaty.[72]

While Article XII allows the treaty to be amended after thirty years by a review conference, or by the consent of all ATCPs, this part of the treaty has not been used to expand the ATS. The negotiations preceding the Madrid Protocol negated the need for a separate review of the Antarctic Treaty.[73]

The Antarctic Treaty did not try to address economic issues, and it only briefly touched on environmental issues in a list of areas that the ATCM could develop measures about,

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The main current stumbling block is a refusal by the United Kingdom to support a Secretariat based in Argentina. See also Chapter 2, note 42, p.15.

[71] Poland was unable to host the 2000 ATCM. A special consultative meeting (SCM) was held in the Netherlands.

[72] Appendix I, Article IX.

[73] Christoper C. Joyner, op. cit., p.164.

mentioning the "preservation and conservation of living resources in Antarctica".[74] This is not a great deal of attention to environmental issues, but in the context of 1959 it is understandable. This has been expanded on in three significant conventions regulating conservation and resource management in the area covered by the Antarctic Treaty. The first of these was the Convention for the Conservation of Antarctic Seals (CCAS) (Done in London 1 June 1972, in force 11 March 1978). The second was the Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR) (Done in Canberra 20 May 1980, in force 7 April 1982). The third was the Annex II to the Protocol on Environmental Protection to the Antarctic Treaty: Conservation of Antarctic Flora and Fauna (Done in Madrid 4 October 1991, entered into force 14 January 1998). When this entered force, it superseded the earlier Agreed Measures on Flora and Fauna (hereafter called the Agreed Measures) adopted at the 1964 Brussels ATCM III as recommendation III-VIII. A fourth agreement, the Convention for the Regulation of Antarctic Mineral Resource Activities (CRAMRA) (Done in Wellington, 2 June 1988) was signed, but is unlikely to enter into force in the foreseeable future.

The Agreed Measures

Three subsidiary objectives are mentioned in the preamble to the Agreed Measures: to protect indigenous flora and fauna, to foster collaborative scientific research, and the rational use of these fauna and flora, where rational use was left further undefined.[75] Antarctica was designated a 'Special Conservation Area', but this was not defined. The Agreed Measures were outlined in fourteen articles and, like the Antarctic Treaty, these were limited by the need to preserve the sovereignty compromise and to avoid jurisdictional problems. Article I established the area of the measures to be the same as that of the Antarctic Treaty. Article VI limited the rights to kill or capture native mammals and birds in the Antarctic Treaty area. Article VII sought to minimise coastal pollution and harmful interference, while Article VIII enabled the establishment of areas of outstanding scientific interest as Specially Protected Areas (SPAs). In 1972 a new category of SPA, the Site of Special Scientific Interest (SSSI), was established to differentiate between sites of scientific and conservation interest. Article IX prohibited importing non-indigenous animal or plant life into Antarctica without a permit.

[74] Appendix I, Article IX, (2) (f).
[75] Christoper C. Joyner, op. cit., p.66.

The Agreed Measures were limited by the fact that they could only be applied to members of the Antarctic Treaty, although they did try to influence the actions of third parties, and depended on national means for implementation. Unlike other environmental protection measures developed by the ATS, the Agreed Measures are not a treaty. The Agreed Measures also did not apply to the high seas (conservation stops at the edge of the ice shelf of the Antarctic continent) so a seal could be protected while it was on an ice shelf, and hunted when it was in the Southern Ocean. The permit system also allowed states to take unilateral action, and no compliance mechanisms were adopted.[76] Ratification of the Agreed Measures was slow, and by 1972 only eight ATCPs had signed due to the difficulty of non-claimants enacting the required legislation.[77] The Agreed Measures only became binding in 1983, although they had been treated as an interim guide line since 1964.[78] The Agreed Measures have been seen as the important first step in the development of environmental protection in the ATS, but adherence to their requirements, especially of the SPAs, was marginal at times.[79]

Convention for the Conservation of Antarctic Seals

In the 1964/65 split year there was a pilot Norwegian expedition in the Antarctic area which raised the possibility of commercial exploitation of seals occurring again.[80] This activity was outside the scope of the Agreed Measures, which only covered seals on islands or the continent. To avoid chaos and to contain this potential development, the ATCPs negotiated a new convention to cover the high seas in the area below 60° South latitude.[81] At this time a separate convention was viewed as necessary, as it was doubtful whether the Antarctic Treaty was competent over the high seas,[82] and a separate convention would allow third parties to join.[83] The negotiations were conducted in secret, with little international or non-governmental organisation interest.[84] CCAS's most

[76] Lorraine M. Elliott, op. cit., p.66.
[77] P. J. Beck, op. cit., pp.219-220, and P.W. Quigg, op. cit., pp.159-160, discuss some of the countries that had constitutional constraints.
[78] P. J. Beck, op. cit., p.220.
[79] Lorraine M. Elliott, op. cit., at pp.66-72, discusses the inadequate rules and lack of proper review.
[80] Arthur Watts, *International Law and the Antarctic Treaty System*, Grotius Publications Limited: Cambridge, England, 1992, p.212.
[81] *Report of the 1988 Meeting to Review the Operation of the Convention for the Conservation of Antarctic Seals*, London, 12-16 September 1988, Foreign and Commonwealth Office: London, 1989, p.31 and 47.
[82] Arthur Watts, op. cit., p.212.
[83] Emilio J. Sahurie, op. cit., p.524.
[84] Lorraine M. Elliott, op. cit., p.83.

significant contribution was that "it sought to regulate a *potential* problem, rather than waiting for the problem to have arisen and become serious."[85]

Seals on land were still covered by the Agreed Measures, so CCAS only covers the seals found on the floating pack ice or high seas of the Southern Ocean. The different positions on sovereignty were also preserved. The principal obligations rely on national measures, as there are no collective enforcement mechanisms. An annex containing detailed regulations is integral to the convention, and it can be amended. CCAS members can object to an amendment and it does not then apply to them. Provision is made for the exchange of information and for SCAR to act as an advisory body. If commercial sealing started, there was provision for a commission to be established to oversee the commercial activity, and for an advisory committee to be set up.

The CCAS was reviewed in 1988 by its members. It was seen as slightly outdated because of its single-species approach, overtaken by the ecosystem approach embodied in CCAMLR.[86] No significant exploitation of seals has taken place in the Southern Oceans since the nineteenth century; sealing has not been commercially viable and it has been argued that CCAS may have played a deterrent effect.[87] However CCAS was important in breaking new ground and facilitating CCAMLR.[88] The killing of Ross, Fur, and Elephant seals was prohibited, and the harvesting of Leopard, Weddell, and Crabeater seals is restricted. Now that dogs have been removed from Antarctica, seals are no longer killed for their meat, and from May 1998 to May 1999 no Seals were reported killed in Antarctica.[89] CCAS remains "the Cinderalla of the Antarctic Treaty system";[90] and its activation has not been needed. Two minor alterations were made to the CCAS in 1990, but public attitudes today would be unlikely to support a resumption of commercial sealing.[91]

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[85] Arthur Watts, op. cit., p.213. Emphasis in the original.
[86] *Report of the 1988 Meeting to Review the Operation of the Convention for the Conservation of Antarctic Seals, London, 12-16 September 1988*, Foreign and Commonwealth Office: London, 1989, p.31.
[87] P. J. Beck, op. cit., 1986, p.221.
[88] *Report of the 1988 Meeting to Review the Operation of the Convention for the Conservation of Antarctic Seals, London, 12-16 September 1988*, Foreign and Commonwealth Office: London, 1989, p.34.
[89] 520 Antarctic Fur Seals were captured and released by Chile during that period, United Kingdom, *Report Submitted to the XXIIIrd Antarctic Treaty Consultative Meeting by the Depositary Government of the Convention for the Conservation of Antarctic Seals (United Kingdom) in Accordance with Recommendations XII 2*, Paragraph 2(D), XXIII ATCM IP/81, 1999.
[90] *Report of the 1988 Meeting to Review the Operation of the Convention for the Conservation of Antarctic Seals, London, 12-16 September 1988*, Foreign and Commonwealth Office: London, 1989, p.46.
[91] Lorraine M. Elliott, op. cit., p.87.

Convention for the Conservation of Antarctic Marine Living Resources

At the 1975 Oslo ATCM, the idea of a convention to regulate all marine resource activities in the Southern Ocean was placed on the agenda.[92] This was prompted by the growing interest in the potential of krill harvesting, an already existing interest in fishing, and the memory of historical sealing and whaling activities. The anticipation of future negotiations concerning the exploitation of mineral resources in Antarctica may also have played a role in the decision to negotiate CCAMLR.[93] The economic use of marine resources was not covered by the existing ATS framework. A convention was desired because fishing was an activity of interest to non-ATCPs,[94] and the ATCPs did not want to be overtaken by outside influence or events – such as the FAO, or ongoing United Nations Convention on the Law of the Sea (UNCLOS) negotiations and the gradual acceptance of the 200 mile Exclusive Economic Zone (EEZ) concept.[95] SCAR was also asked to develop a research plan for the Southern Ocean and this led to the initiation of BIOMASS (Biological Investigation of Marine Antarctic Stocks and Systems) to "acquire better understandings of the composition of the Southern Ocean ecosystem and the relationship among its species."[96] At the 1977 London ATCM, guidelines for the negotiation of a regime for living marine resources were laid out.[97]

CCAMLR was negotiated at a time when environmental norms relevant to Antarctica were beginning to influence views, but the ATCP norms supported a synthesis of environmental and exploitation interests.[98] These negotiations were conducted in secret, preserving the dominant role of the ATCPs and preventing external interference.[99] Poland became an

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[92] Recommendation VIII-10 'Antarctic Marine Living Resources', to be included on the agenda at ATCM-IX. Antarctic Treaty, *Report of the Eight Consultative Meeting, Oslo, 9-20 June 1975*, Ministry of Foreign Affairs: Oslo, 1976, p.40.

[93] James N. Barnes, "The Emerging Convention on the Conservation of Antarctic Marine Living Resources: An Attempt to Meet the New Realities of Resource Exploitation in the Southern Ocean", in Jonathon I. Charney (ed), *The New Nationalism and the Use of Common Spaces: Issues in Marine Pollution and the Exploitation of Antarctica*, Allanheld Osmun: Totawa NJ, 1982, p.243 and 248.

[94] Lorraine M. Elliott, op. cit., p.82.

[95] F. M. Auburn, op. cit., p.206.

[96] Christoper C. Joyner, op. cit., p.122.

[97] Recommendation IX-2, Antarctic Treaty, *Report of the Ninth Consultative Meeting, London, 19 September - 7 October 1977*, Foreign and Commonwealth Office: London, 1977, pp.13-16.

[98] P. J. Beck, op. cit., pp.222-223.

[99] For detail of the CCAMLR negotiations see David M. Edwards and John A. Heap, "Convention on the Conservation of Antarctic Marine Living Resources: A Commentary", *Polar Record*, 20 (127), 1981, pp.353-362, Ronald F. Frank, "The Convention on the Conservation of Antarctic Marine Living Resources", *Ocean Development and International Law Journal*, 13 (3), 1983, pp.291-345, and James N. Barnes, op. cit., pp.239-287.

ATCP in 1977 because of its interest in krill harvesting.[100] The CCAMLR negotiations represent the first involvement of non-governmental organisations (NGOs) in the ATS, with the participation of the International Union for the Conservation of Nature (IUCN) and two NGO representatives on the United States delegation.[101]

The CCAMLR negotiations stalled over two problems: first the problem of islands in the convention area to which sovereignty was undisputed, such as the French Kerguélen and Crozet Islands, and the position of the European Community (EC) in relation to the convention. One factor in the sovereignty problem was that both claimants and non-claimants were attempting to protect interests to potential minerals exploitation in the future.[102] A compromise was reached over the EC issue whereby the EC only became a participating member once the convention was in force, and only participates where it is competent to do so, such as on issues of fishing for which the EC has developed a common policy.[103]

The CCAMLR negotiations had to find a way to take into account the undisputed claims to islands within the CCAMLR area while preserving the moratorium on the disputed territorial claims in the Antarctic. One part of the solution to this sovereignty problem can be seen in the French note in the preamble. This understanding applies "to waters adjacent to the islands within the area to which this Convention applies over which the existence of State sovereignty is recognized by all Contracting Parties."[104] This allows the states with sovereignty to choose to "agree that the waters in question should be included in the area of application of any specific conservation measure"[105] proposed by the Commission. Any measures adopted would be enforced by the relevant state,[106] and the state could promulgate national measures that are stricter than the Commission's.[107]

The other part of the solution dealt with the issue of the claims in the Antarctic. The CCAMLR convention repeated Article IV of the Antarctic Treaty with an additional phrase. Under CCAMLR Article IV (2) (b) nothing shall:

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[100] F. M. Auburn, op. cit., p.205.
[101] Lorraine M. Elliott, op. cit., p.89.
[102] James N. Barnes, op. cit., p.265.
[103] P.W. Quigg, op. cit., pp.184-185. See also Appendix II, Article VII (2) (c) and Article XXIX, (2).
[104] Appendix II, Text of Statement included in the Final Act of the Conference, (5).
[105] Appendix II, Text of Statement included in the Final Act of the Conference, (2).
[106] Appendix II, Text of Statement included in the Final Act of the Conference, (4).

> be interpreted as a renunciation or diminution by any Contracting Party of, or as prejudicing, any right or claim or basis of claim to exercise coastal state jurisdiction under international law within the area to which this Convention applies;[108]

This deliberate ambiguity of 'coastal state jurisdiction' has been called the 'bifocal approach'.[109] It allows states with different positions on the territorial claims in Antarctica to have different interpretations of the same articles in the convention.

The aim of CCAMLR was to safeguard the environment and protect the ecosystem of the Southern Ocean.[110] The Convention covers all the marine living resources of the Southern Ocean, with the exceptions that the regulation of sealing is left to CCAS, and the regulation of whales is left to the International Convention for the Regulation of Whaling.[111] The convention boundary follows the line of the convergence, not the arbitrary 60° South latitude of the Antarctic Treaty.[112] The ecosystem was defined as "the complex of relationships of Antarctic marine living resources with each other and their physical environment."[113] The main principles of conservation are articulated in Article II, and these embody what is known as the 'precautionary approach'. As conservation was defined to include rational use, this would eventually allow harvesting based on scientific knowledge. The ecosystem concept and precautionary approach were innovative and allowed environmental protection to move beyond the concept of Maximum Sustainable Yield (MSY).[114] The MSY concept was too difficult to implement in practice and led to substantial depletion of marine resource stocks from over-harvesting. This attention to the ecosystem was a point of difference from traditional fisheries commissions.[115]

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[107] Appendix II, Text of Statement included in the Final Act of the Conference, (3) (a).
[108] Appendix II, Article IV (2) (b).
[109] See Christopher C. Joyner, *Antarctica and the Law of the Sea*, Martinus Nijhoff Publishers: Dordrecht, 1992, pp.226-228, and Lorraine M. Elliott, op. cit., pp.92-97.
[110] Appendix II, Preamble.
[111] Appendix II, Article I (2), and Article VI. This was quite deliberate. Christopher C. Joyner, *Governing the Frozen Commons: The Antarctic Regime and Environmental protection*, University of South Carolina Press: Columbia, South Carolina, 1998, p.123, sees it as a 'bridge' linking CCAMLR to other international regimes governing the high seas.
[112] Appendix II, Article I.
[113] Appendix II, Article I (3).
[114] Some claims have been made that CCAMLR was the first use of the ecosystem principle, however the ecosystem concept was used prior to CCAMLR, see Matthew Howard, "The Convention on the Conservation of Antarctic Marine Living Resources: A Five Year Review", *International Law Quarterly*, Vol.38, 1989, p.113, and James N. Barnes, op. cit., p.250.
[115] J.A. Gulland, op. cit., p.229.

While CCAMLR is a separate instrument, it is still intimately connected to the ATS and forms a significant part of the ATS. CCAMLR Article VI acknowledges CCAS, while Article III binds Contracting Parties of CCAMLR to the peaceful purposes and denuclearisation principles of the Antarctic Treaty.[116] CCAMLR Article IV binds Contracting Parties to Articles IV and VI of the Antarctic Treaty. CCAMLR Article V (1) requires the Contracting Parties to acknowledge "the special obligations and responsibilities of the [ATCPs] for the protection and preservation of the environment of the Antarctic Treaty area."[117] This means that states joining CCAMLR have to accept the principles that allow the Antarctic Treaty to function.[118]

Unlike the earlier instruments of the ATS, the CCAMLR convention established an institution with a headquarters in Hobart, Tasmania,[119] and a supporting secretariat.[120] This is the Commission for the Conservation of Antarctic Marine Living Resources.[121] The initial framework of the Commission is outlined in Articles VII to XIII. In carrying out the objectives and principles of the Convention, the Commission is responsible for facilitating "research into and comprehensive studies of Antarctic marine living resources and of the Antarctic marine ecosystem;"[122] for implementing a system of observation and inspection,[123] and has to "formulate, adopt, and revise conservation measures on the basis of the best scientific advice available".[124]

While the original CCAMLR Contacting Parties are always entitled to membership of the Commission,[125] CCAMLR has two stages of membership for states that became Contracting Parties at a later date. While any state "interested in research or harvesting activities in relation to the marine living resources to which this Convention applies"[126] is allowed to accede to CCAMLR, an acceding state is only "entitled to be a Member of the Commission during such time as that acceding party is engaged in research or harvesting

[116] Appendix II, Article III.
[117] Appendix II, Article V (1).
[118] P. J. Beck, op. cit., p.228.
[119] Appendix II, Article XIII (1).
[120] Appendix II, Article XVII.
[121] Appendix II, Article VI (1).
[122] Appendix II, Article IX (1) (a).
[123] Appendix II, Article IX (1) (g).
[124] Appendix II, Article IX (1) (f).
[125] Appendix II, Article VII (2) (a).
[126] Appendix II, Article XXIX (1).

activities in relation to the marine living resources to which this Convention applies;"[127] CCAMLR also allows for invited observers to attend CCAMLR meetings.[128]

In addition to the Commission, a Scientific Committee was established as a consultative body to the Commission.[129] Each member of the Commission is also a member of the Scientific Committee.[130] The initial framework of the Scientific Committee is outlined in Articles XIV to XVI of the Convention. CCAMLR entered into force in 1982 and at the end of 2001 has twenty-four members of the Commission, with another seven acceding states.[131]

The scope of the Convention's conservation measures are dealt with in Article IX. There is an opt-out clause that allows members of the Commission to state the extent to which a conservation measure will not be binding on them.[132] If this occurs, other members of the Commission may review their position on the conservation measure and also opt out of being bound by it.[133] Otherwise, all conservation measures become binding on all members of the Commission 180 days after the Commission has notified all members of the conservation measure.[134] In addition to this, all "Decisions of the Commission on matters of substance shall be taken by consensus."[135] This has the effect of granting all members of the Commission a 'veto' over the introduction of a new conservation measure.

CCAMLR's means of enforcing conservation measures are weak and rely on voluntary compliance among both its members and any other third parties who may be active in the Southern Ocean. There are no collective mechanisms for enforcement powers. Specific responsibility for imposition of penalties lies with members. A system of inspection was established in 1989/90, but fishery patrols suffer from prohibitive costs due to the

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[127] Appendix II, Article VII (2) (b).
[128] Appendix II, Article XXIII.
[129] Appendix II, Article XIV (1).
[130] Appendix II, Article XIV (2).
[131] The members are: Argentina, Australia, Belgium, Brazil, Chile, European Community, France, Germany, India, Italy, Japan, Republic of Korea, Namibia, New Zealand, Norway, Poland, Russian Federation, South Africa, Spain, Sweden, Ukraine, United Kingdom, United States and Uruguay. States that have ratified the Convention, but are not members of the Commission are: Bulgaria, Canada, Finland, Greece, the Netherlands, Peru, and Vanuatu. http://www.ccamlr.org/English/e_m_ship/e_membership.htm (site visited 30 January, 2002).
[132] Appendix II, Article IX (6) (c).
[133] Appendix II, Article IX (6) (d).
[134] Appendix II, Article IX (6) (a) to (b).
[135] Appendix II, Article XII (1).

remoteness of the Southern Oceans.[136] CCAMLR has found it difficult to balance short-term economic interests with conservation needs. All resource use suffers from the problem of biological uncertainty, for without accurate knowledge of stocks any catch level could be too much.

The Convention for the Regulation of Antarctic Mineral Resource Activities

In the 1980s, diplomatic efforts in Antarctica focused on negotiating an agreement on exploiting mineral resources, starting with the Fourth Special Consultative Meeting (SCM) in July 1982.[137] At that time, exploitation of minerals was seen as an activity which was legitimate and should be permitted in Antarctica.[138] CCAMLR had been seen by many observers as a trial of the ATS members' ability to negotiate resource issues that had sovereignty implications.[139] However, it was going to be difficult to apply principles developed for renewable living resources to non-renewable mineral resources. The CRAMRA negotiations were significant because of the bearing that commercial mineral resource activity had on the sovereignty claims to Antarctic territory. The CRAMRA agreement was negotiated and signed but it was not ratified. CRAMRA reflected the sovereignty norms and political compromises of the Antarctic Treaty, with a complex institutional framework.[140]

An important paradigm shift occurred among the ATCPs in 1989-1991, starting with the announcement from Australia and France that they had withdrawn their support for CRAMRA and were seeking a ban on mining.[141] CRAMRA was internally inconsistent in its assumption that mineral development could be regulated with adequate environmental protection, and the public acceptability of the regime had changed.[142] Doubts existed over the adequacy of the environmental rules, and the strength of the compliance provisions.[143] A key event that helped mobilise public awareness and opinion was the accident involving the Argentine resupply ship, the *Bahia Paraiso*, spilling 150,000 gallons of oil into the

[136] Karl-Hermann Kock, "Fishing and Conservation in Southern Waters", *Polar Record*, 30 (172), 1994, p.11.
[137] On these negotiations see Lorraine M. Elliott, op. cit., pp.121-135.
[138] op. cit., p.121.
[139] Matthew Howard, op. cit., p.105, and Lorraine M. Elliott, op. cit., pp.87-88.
[140] Lorraine M. Elliott, op. cit., p.135. See pp.135-152 for an examination of the provisions of CRAMRA.
[141] ibid., pp.163-165, the French announcement was on 20 April 1989, and the Australian announcement was made 22 May 1989.
[142] ibid., p.161.

Southern Ocean on 28 January, 1989.[144] The collapse of CRAMRA and the introduction of the Protocol on Environmental Protection to the Antarctic Treaty (hereafter the 'Madrid Protocol') was a significant and successful test of the robustness of the ATS regime.

The Protocol on Environmental Protection to the Antarctic Treaty

The Madrid Protocol was negotiated quickly, in an atmosphere of some rancour over the defection from CRAMRA, and the important consensus rule of the ATS.[145] Despite this, a new consensus emerged, and the ATCPs committed "to the comprehensive protection of the Antarctic environment and dependent and associated ecosystems".[146] The Madrid Protocol is a long and complex document compared to the earlier instruments of the ATS, and it was influenced by the design of CRAMRA. The economic interests of the ATCPs to Antarctic minerals were put aside, but not eliminated, just as their territorial interests had been under the Antarctic Treaty. The importance of environmental protection displaced the old assumptions about the inevitability of resource exploitation. This demonstrated the resilience of the ATS and the goodwill of the ATCPs in achieving a balanced compromise.[147]

The Madrid Protocol is comprehensive because it "establishes general environmental principles which *must* be applied to all activities in the Antarctic."[148] Unlike the earlier Antarctic Treaty, all governmental and non-governmental activity by state parties is covered.[149] Article 3 of the Madrid Protocol lays out the environmental principles, by making them "fundamental considerations in the planning and conduct of all activities in the Antarctic Treaty area."[150] To this end, any "activity relating to mineral resources, other than scientific research, shall be prohibited."[151] The political compromises of the ATS

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[143] ibid., pp.152-160.
[144] ibid., p.165. A greater disaster occurred in Alaska when the *Exxon Valdez* ran aground 24 March 1989, spilling 10.8 million gallons of oil. http://www.oilspill.state.ak.us/history/history.htm (site visited 26 February 2001).
[145] New Zealand Minister of Foreign Affairs, Russell Marshall: "Australia will have a good deal to answer for if it fails" in Anonymous, "Antarctic Antics", *New Scientist*, 122 (1667), 3 June, 1989, p.20. Christoper C. Joyner, op. cit., p.165: "A residue of resentment remains over the failure to consummate the CRAMRA process and over the manner in which the minerals agreement was brought down."
[146] Madrid Protocol, Article 2.
[147] Christoper C. Joyner, op. cit., pp.163-164.
[148] Lorraine M. Elliott, op. cit., p.200. Emphasis in the original.
[149] Christoper C. Joyner, op. cit. p.151.
[150] Madrid Protocol, Article 3 (1).
[151] Madrid Protocol, Article 7.

were preserved by Articles 5 and 6 of the Madrid Protocol which outline the relationship and consistency of the Madrid Protocol with the components of the ATS. However, Article 13 of the Madrid Protocol requires parties to comply with the Protocol.[152] This is also covered by a provision for inspection by observers.[153]

Dispute settlement provisions are covered in Articles 18-20, and allow resolution through the ICJ or the Arbitral Tribunal established in the Schedule to the Protocol.[154] These provisions also cover the annexes to the Madrid Protocol.[155] This is a tighter requirement for dispute resolution because where parties disagree about the resolution of a dispute it may only go to the Arbitral Tribunal.[156] However, some limits are imposed to preserve the sovereignty compromise of the ATS, and neither the Arbitral Tribunal or the ICJ are competent to "rule upon any matter within the scope of the Article IV of the Antarctic Treaty",[157] or on the sovereign immunity of ships in Annex IV.[158]

Although it took until 1998 for the Madrid Protocol to enter into effect with the last ratification by Japan in late 1997, a new institution was established: the Committee for Environmental Protection (CEP).[159] CEP was first officially convened at the 1998 XXII ATCM in Tromsø, although a Temporary Environmental Working Group (TEWG) was established at the XVIII ATCM in Kyoto to anticipate and prepare for the establishment of the CEP. The TEWG met three times at different ATCMs and did the basic groundwork for CEP. The functions of the CEP are outlined in Article 12 of the Madrid Protocol. The CEP lacks authority to enforce compliance with the Madrid Protocol; this is left to the governments of the parties to the Madrid Protocol. Both SCAR and CCAMLR send observers to CEP meetings.

The transparency of the ATS was increased with the Madrid Protocol. NGOs can be invited to CEP meetings as observers.[160] CEP reports and documents must be made

[152] Madrid Protocol, Article 13 (1)-(3).
[153] Madrid Protocol, Article 14.
[154] Madrid Protocol, Article 19 (1).
[155] Madrid Protocol, Article 9 (5).
[156] Madrid Protocol, Article 19 (1)-(5).
[157] Madrid Protocol, Article 20 (2).
[158] Madrid Protocol, Annex IV, Article 11 (4).
[159] Madrid Protocol, Article 11.
[160] Madrid Protocol, Article 11 (4).

public,[161] as must those relating to environmental impact assessment,[162] and managed and protected areas.[163] At the CEP II meeting in 1999, a decision was made that a web page should be established by the home country of the current CEP chair, although it was noted that this should be the province of an Antarctic Treaty secretariat.[164]

Five annexes were included as an integral part of the Madrid Protocol. These relate to environmental impact assessment (EIA), conservation of flora and fauna, waste disposal and management, marine pollution, and area protection and management.[165] EIA is also covered in Article 8 of the Madrid Protocol. The key EIA provision is that an activity may only proceed if it will have "less than a minor or transitory impact".[166] However, a problem here is that 'minor' and 'transitory' have not been defined in the Madrid Protocol and have been left to be worked out over time. The procedure for evaluating EIA is left with governments, not CEP, so the governments are able to do what they wish. Christopher Joyner observed that the "Protocol appears to place a great deal of faith in diplomatic pressure as an effective check against governments making irresponsible national decisions."[167]

Annex II on the Conservation of Flora and Fauna transforms the Agreed Measures into a legally binding document and updates their regulations. It extends protection, bans dogs in Antarctica from 1994, and damaging native plants is now considered harmful interference to the environment. Annex III on Waste Disposal and Waste Management imposes obligations to reduce the waste produced and disposed in the Antarctic Treaty area in order to minimise interference with the natural values, scientific research, and the other uses of Antarctica.[168] The parameters are a little vague "as far as practicable" and "to the maximum extent practicable" which can make accountability difficult.[169] Some of the forms of disposal, such as incineration and discharge into the sea have been objected to.[170]

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[161] Madrid Protocol, Article 11 (5), and Article 17, (2).
[162] Madrid Protocol, Annex I, Article 6.
[163] Madrid Protocol, Annex V, Article 9.
[164] CEP II – Appendix 1, Decision 1 (1999), CEP Web site. The web site is currently hosted at http://www.npolar.no/cep/.
[165] Madrid Protocol, Article 9 Annexes, and Annexes I-V.
[166] Madrid Protocol, Annex I, Article 2 (2).
[167] Christoper C. Joyner, op. cit., p.156.
[168] Madrid Protocol, Annex III, Article 1.
[169] Christoper C. Joyner, op. cit., p.158.
[170] ibid.

Annex IV Prevention of Marine Pollution attempts to restrict the discharge of oil, noxious liquid substances, or sewage, and the disposal of garbage in the Antarctic Treaty area. It also links the ATS to the 1973 International Convention for the Prevention of Pollution from Ships (MARPOL), as amended by a Protocol in 1978.[171] A problem here is the sovereign immunity of Article 11 which prevents the annex from applying to "any warship, naval auxiliary or other ship owned or operated by a state and used ... only on government non-commercial service."[172] This probably covers most of the ships operating in the Southern Ocean.[173] Compliance is the responsibility of ship flag states.

The fifth and last Annex was on Area Protection and Management. This consolidated the five existing types of protected zones into two types of protected area: Antarctic Specially Protected Areas (ASPA) are areas to be "kept inviolate from human interference",[174] and include all SPA and SSSI designated in the past;[175] Antarctic Specially Managed Areas (ASMA) are areas where activity is expected to be conducted.[176] This annex promotes cooperation and coordination in Antarctica and helps avoid environmental damage.[177]

The Madrid Protocol is not a final solution to the problems of Antarctica, as it may be "modified or amended at any time in accordance with the procedures set forth in Article XII (1) (a) and (b) of the Antarctic Treaty."[178] While this requires unanimity for amendments, the Madrid Protocol may also be amended after fifty years from its entry into force, and this only requires "a majority of the Parties, including 3/4 of the States which are [ATCPs] at the time of adoption".[179] However the prohibition on mineral resource activities is to remain in force until a binding legal regime on the acceptable use of mineral resource activities is negotiated,[180] and the ban "provides powerful symbolic value."[181] This 'walk out' clause was inserted largely at the insistence of the United States, and is of some concern to environmentalists as a potential weakness of the Madrid Protocol.[182]

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[171] Madrid Protocol, Annex IV, Article 1 (c).
[172] Madrid Protocol, Annex IV, Article 11 (1).
[173] Christoper C. Joyner, op. cit., p.160.
[174] Madrid Protocol, Annex V, Article 3 (2) (a).
[175] Madrid Protocol, Annex V, Article 3 (3).
[176] Madrid Protocol, Annex V, Article 4.
[177] Christoper C. Joyner, op. cit., p.162.
[178] Madrid Protocol, Article 25 (1).
[179] Madrid Protocol, Article 25 (3).
[180] Madrid Protocol, Article 25 (5) (a).
[181] Christoper C. Joyner, op. cit. p.163.
[182] ibid., pp.166-168.

The Madrid Protocol is not a permanent ban or a declaration of a world park; Antarctica was only designated as a "natural reserve, devoted to peace and science."[183] There has also been a failure to negotiate the liability annex required by Article 16 of the Madrid Protocol, despite extensive negotiations. The effectiveness of any liability system depends on the enforcement mechanism, and this is complicated by the problems of international commons.[184] This failure to promulgate a liability annex represents a weakness in the agreement. The area of coverage is limited to 60° South latitude, and omits the Sub-Antarctic islands outside the treaty area – something that may impede the effectiveness of the Madrid Protocol in protecting the environment.[185] Overall, however, the Madrid Protocol has revitalised the ATS in the wake of the collapse of CRAMRA.[186]

Sovereignty and the Environment in the Southern Ocean

The issue of sovereignty needs to be carefully considered in relation to the Southern Ocean because of the implications that current international law has with respect to managing the fisheries of the Southern Ocean under the ATS. While Antarctica, in many instances, is a unique area in international law, the Southern Ocean shares many of the problems of the high seas around the globe.

Background to sovereignty

Antarctica is the only continent without indigenous inhabitants. As such, it had a status of *terra nullius* (land owned by no one) before Antarctica was discovered. Discovery of *terra nullius* territory gives an inchoate title to that territory that must be perfected within a reasonable period for a state to clearly establish sovereignty over that territory.[187] Despite this, acts of discovery are a major argument used by Antarctic claimants, although it is usually argued that title was accrued before the claim was formalised.[188] One problem here is that actually identifying who discovered Antarctica, or various parts of the continent, is

[183] Madrid Protocol, Article 2.
[184] Christoper C. Joyner, op. cit., pp.169-173.
[185] ibid. pp.165-166.
[186] ibid, p.173.
[187] *Island of Palmas Case* (1928) between the United States and the Netherlands, *Clipperton Island Case* (1931) between France and Mexico, *Case Concerning the Legal Status of Greenland* (1931) between Norway and Denmark. See Arthur Watts, op. cit., pp.121-124.

extremely difficult. Another problem is that the time period for perfecting a claim is not defined.

Many states have performed acts of symbolic annexation in Antarctica, such as reading proclamations and depositing claim markers. "Symbolic annexation is essentially discovery coupled with a manifestation of intent to claim."[189] The *Clipperton Island Case* demonstrated that the effective occupation test could be modified for a small, uninhabited area.[190] It is difficult to imagine that an entire continent could be claimed in the same manner. Sighting the land and performing symbolic acts is not sufficient to sustain a claim in Antarctica, even though these acts have some probative value. To sustain a claim in Antarctica a state had to demonstrate the intention and will to act as sovereign, or *animus occupandi*.[191] This requires formal notification to other states.[192] While the claimants in Antarctica have advanced various theories to support their claims, such as geographical propinquity, geological continuity, patrimony, and sector theory, serious consideration of their claims remains focused on whether or not Antarctica has been effectively occupied.[193]

Of the historical methods of acquiring sovereignty, only occupation and cession apply in Antarctica. The cession of title between Britain, and Australia, and New Zealand can only be valid if the occupation by Britain was sufficient to establish a valid claim to a title in the first place. The international law test for occupation is derived from Article 35, Chapter VI, of the Act of Berlin, and from subsequent international practice. Occupation requires a state sanctioned settlement that is permanent, useful, and continuous.[194] In Antarctica, this has primarily been done through the establishment and maintenance of scientific bases. Some attempts at colonisation have been made, mostly by Chile and Argentina.

The key issue here is whether or not Antarctica would be treated leniently in regards to fulfilling the requirements for occupation due to its inhospitable nature. The United States position on British claims in Antarctica articulated by Secretary of State Hughes in 1924

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[188] F. M. Auburn, op. cit., p.6.
[189] op. cit., p.11.
[190] Emilio J. Sahurie, op. cit., pp.257-259.
[191] Christopher C. Joyner, *Antarctica and the Law of the Sea*, Martinus Nijhoff Publishers: Dordrecht, 1992, pp.50-55.
[192] F. M. Auburn, op. cit., pp.15-17.
[193] These claims are extensively discussed in Chapter 4 "National Claims to Establish Exclusive Appropriation of Antarctica", of Emilio J. Sahurie, *The International Law of Antarctica*, New Haven Press: New Haven, 1992.

was that a valid claim of sovereignty required actual settlement.[195] This policy was maintained even when permanent settlements began to be established in Antarctica in the 1940s.[196] Claimant states routinely perform state acts, such as the appointment of officials, issuing postage stamps, and passing legislation concerning the claimed area. The interpretation of effective occupation is subjective.[197] Each such claim would have to be treated independently.[198] The view of non-claimants is that the claims are fiction. If Antarctica has not been appropriated then it is not appropriable and *terra nullius de facto* becomes *terra nullius de jure*.[199] However, if sovereignty was actually acquired at some stage in the past, then that sovereignty "depends primarily on the law and the facts as they were *at that time past*, rather than as they might stand today."[200]

In the 1960s, a new alternative approach to sovereignty emerged that focussed on applying the common heritage principle to unique global resources, such as outer space and the deep seabed of the ocean floor.[201] The efforts of the 'Nonaligned Movement' and the 'Group of 77' developing nations were important in creating the global politico-economic movement and were known as the 'new international economic order' (NIEO) in the 1970s.[202] This approach denied the validity of any claims to the *terra communis* in Antarctica and the challenged international acceptability of the ATS. Advocates of this approach favoured a more representative international regime, possibly modelled on some UN-based organisation.[203] In a similar vein are calls for a 'world park' in Antarctica, although these are centred around increasing the environmental protection rather than increasing the economic exploitation of Antarctica.[204]

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[194] F. M. Auburn, op. cit., pp.11-14.
[195] See Chapter 3, note 39, p.63.
[196] Emilio J. Sahurie, op. cit., pp.32-35.
[197] Christopher C. Joyner, op. cit., p.66.
[198] Arthur Watts, op. cit., p.122.
[199] Christopher C. Joyner, op. cit., p.65.
[200] Arthur Watts, op. cit., p.123. Emphasis in the original.
[201] The first Treaty On Outer Space was adopted by the UN General Assembly in 1967. A second, more comprehensive treaty, the Moon Treaty, was adopted by the UN General Assembly in 1979, but was not subsequently ratified by the United States.
[202] Bernard P. Herber, "The Common Heritage Principle: Antarctica and the Developing Nations", *American Journal of Economics and Sociology*, 50 (4), 1991, p.392.
[203] P. J. Beck, op. cit., p.115.
[204] Bernard P. Herber, "Mining or World Park? A Politico-Economic Analysis of Alternative Land Use Regimes in Antarctica.", *Natural Resources Journal*, 31, 1991, pp.839-857. See also D. R. Rothwell, *A World Park for Antarctica: Foundations, Developments and the Future*, Antarctic and Southern Ocean Occasional Papers 3, University of Tasmania, Faculty of Law: Hobart, 1990.

This attempt faltered when significant leaders of the developing world, such as India and China, chose to pursue their interests from within the ATS by acceding and gaining ATCP status. The CRAMRA agreement ignored the common heritage principle.[205] This is important because the ATS is the main source of authority for Antarctica and the Southern Ocean at present. The ATS includes the major world powers, and with China and India a large proportion of the world population. As long as the ATS is able to maintain its unity and resiliency, it will continue to exclude rival organisations. For example, during the UN debates on the question of Antarctica the ATCPs maintained a united front and largely refused to vote on the issue.[206] However, in response to external criticism, the workings of the ATS have become more transparent,[207] and there has been a restoration of consensus in the UN since 1994.[208] This was due in part to the Madrid Protocol removing the minerals stake, and the change in government in South Africa removed another source of tension. Rainer Lagoni pointed out that marine living resources are not the kind of resources that are part of the 'common heritage of mankind' in the sense of UNCLOS.[209] Malaysia remains critical of the ATS and still believes that the UN "is the most appropriate authority to enforce, administer and monitor the various scientific and non-scientific activities in Antarctica."[210] However, Malaysia is more engaged with the ATS than it once was. For example, in 1999 Malaysia planned to join a New Zealand scientific project in 2000.[211]

Antarctic Treaty: Article IV

Article IV of the Antarctic Treaty has been of crucial importance in removing the obstacle of competing interpretations of the validity of the various sovereignty claims in Antarctica. According to Article IV (1):

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[205] Bernard P. Herber, "The Common Heritage Principle: Antarctica and the Developing Nations", *American Journal of Economics and Sociology*, 50 (4), 1991, p.397.
[206] P. J. Beck, "The United Nations and Antarctica 1993: continuing controversy about the UN's role in Antarctica", *Polar Record*, 30 (175), 1994, pp.257-264. For the World Park idea, see Keith Suter, *Antarctica: Private Property or Public Heritage?*, Pluto Press Australia: Leichhardt, 1991.
[207] Bernard P. Herber, op. cit., p.400.
[208] Peter, J. Beck, "The United Nations and Antarctica, 1994: The Restoration of Consensus?", *Polar Record*, 31 (179), 1995, pp.419-424.
[209] Rainer Lagoni, "Convention on the Conservation of Antarctic Marine Living Resources: A Model for the Use of a Common Good?", in Wolfrum, Rüdiger (ed), and Klaus Bockslaff (asst. ed), *Antarctic Challenge: Conflicting Interests, Cooperation, Environmental Protection, Economic Development: Proceedings of an Interdisciplinary Symposium June 22nd-24th 1983,* Duncker & Humblot: Berlin, 1984, p.107.
[210] *Statement by Ambassador Hasmy Agam Permanent Representative of Malaysia to the United Nations, On Agenda Item 66: Question On Antarctica, At the First Committee of the 54th Session of the United Nations General Assembly*, New York, Thursday 11 November 1999.
[211] "Fish Plunder Angers NZ: Chch May be Ice Capital", *The Press*, Christchurch, January 28, 1999, p.1.

> 1. Nothing contained in the present Treaty shall be interpreted as:
> (a) A renunciation by any Contracting Party of previously asserted rights of or claims to territorial sovereignty in Antarctica;
> (b) A renunciation or diminution by any Contracting Party of any basis of claim to territorial sovereignty in Antarctica which it may have whether as a result of its activities or those of its nationals in Antarctica, or otherwise;
> (c) Prejudicing the position of any Contracting Party as regards its recognition or non-recognition of any other State's rights of or claim or basis of claim to territorial sovereignty in Antarctica.

Article IV manages to suspend the existing disputes over sovereignty claims. It does this by preserving the position of all the interested parties in a frozen state.[212] This is a non-solution to the disputes as it does not actually resolve the claims, but it does provide a *modus vivendi* that facilitates the working of the ATS. This is reinforced by Article IV (2):

> 2. No acts or activities taking place while the present Treaty is in force shall constitute a basis for asserting, supporting or denying a claim to territorial sovereignty in Antarctica or create any rights of sovereignty in Antarctica. No new claim, or enlargement of an existing claim, to territorial sovereignty in Antarctica shall be asserted while the present Treaty is in force.

There is no foreseeable resolution to the claims while the Antarctic Treaty remains in force, and removal of the provisions of Article IV would cause trouble.[213] The Article IV compromise has been perpetuated throughout the other instruments of the ATS.

The issue of jurisdiction was a weaker element in the Antarctic Treaty. Article VIII provides a compromise that observers, scientific personnel, and their accompanying staffs were subject only to the jurisdiction of the ATCP of which they were nationals. Jurisdiction is important because if a nation allows its citizens to be arrested and tried by another state in relation to activities in Antarctica, then it is implicitly acknowledging the sovereign authority of that state.[214] This is a loose end in the ATS because it does not cover commercial or private actors, such as companies and tourists, in Antarctica. This has been addressed only partly by the Madrid Protocol, which covers "all other governmental and non-governmental activities in the Antarctic Treaty area",[215] but is yet to finalise a complete liability annex.

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[212] "the Treaty did not freeze territorial claims; it merely put them on the back burner to keep warm." Keith Brennan quoted in P.W. Quigg, op. cit., p.196.
[213] Christopher C. Joyner, op. cit., pp.63-64.
[214] P.W. Quigg, op. cit., pp.150-151.
[215] Madrid Protocol, Article 3 (4).

Implications for the environment – the commons problem

The sovereignty problem remains prevalent in Antarctic politics despite the *modus vivendi* of Article IV. States are careful to preserve their position on the sovereignty issue. Argentina and Chile are perhaps the two most vociferous states in this respect. This continues to have an impact on political negotiations concerning Antarctic issues and the actual activities conducted by states in Antarctica. Symbolic acts of sovereignty continue to be expressed. Commitment to Antarctica is often measured in terms of expenditure on scientific research there. This could potentially be important if the ATS unravels and the claims are revisited. Activities conducted during the time of the ATS may still be of value in establishing a claim, despite the provisions of Article IV (2).

A significant development in international law has been the establishment of EEZs after UNCLOS. This has interesting ramifications for the territorial claims in Antarctica and for the environment of the Southern Ocean. UNCLOS established that a coastal state had sovereignty over the adjacent territorial sea to a limit of twelve nautical miles,[216] measured from a baseline at the low water line.[217] All ships enjoy the right of innocent passage through the territorial sea.[218] In addition to this there is a contiguous zone that extends for another twelve nautical miles in which states may exercise the control necessary to prevent and punish infringements of its territorial regulations.[219]

Part V of UNCLOS establishes the specific legal regime that governs the rights of the coastal state and other states in the EEZ. The EEZ extends for up to 200 nautical miles from the baseline of the territorial seas.[220] Within this zone the coastal state has:

> sovereign rights for the purpose of exploring and exploiting, conserving and managing the natural resources, whether living or non-living, of the waters superjacent to the sea-bed and of the sea-bed and its subsoil, and with regard to other activities for the economic exploitation and exploration of the zone, such as the production of energy from the water, currents and winds;[221]

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[216] UNCLOS, Articles 2-4. A copy of UNCLOS can be found at gopher://gopher.un.org/11/LOS/UNCLOS82 (site visited 22 March 2001).
[217] UNCLOS, Article 5.
[218] UNCLOS, Article 17.
[219] UNCLOS, Article 23.
[220] UNCLOS, Article 57.
[221] UNCLOS, Article 56 (1) (a).

The coastal state also has *inter alia* jurisdiction over all marine scientific research and the protection of the marine environment.[222] Other states retain freedom of navigation and overflight, and other lawful uses of the seas.[223] The conservation of marine resources is elaborated in Articles 61-68. The enforcement powers of the coastal state in the EEZ are laid out in Article 73.

The problem of EEZ claims in Antarctica

The standard baseline for measuring zones of jurisdiction at sea is the low water mark on the coastline. The sea zone is linked to the land. If there is no land claim then the adjacent waters are part of the high seas. The Antarctic Treaty is silent on this point.[224] The unresolved nature of Antarctic sovereignty claims complicates the issue. Australia has claimed an EEZ, but so far has chosen not to enforce it. The Australian argument is that the EEZ is now part of its existing claim, rather than an extension to its claim or part of a new claim – which would be prohibited by Article IV of the Antarctic Treaty.[225] The presence of EEZ based on Sub-Antarctic islands with undisputed sovereignty has not proven a great problem for the ATS, although it does complicate the arrangements made for the implementation of CCAMLR conservation measures. However, any attempt to enforce an EEZ with a baseline in Antarctica could start an international controversy.

Finding a baseline in Antarctica is complicated by the nature of the ice shelves. Although permanent, they fluctuate with a perpetual process of calving off new icebergs. Half of the coastline of Antarctica is made of ice sheets, and the ice pack varies between 2.6 million km^2 in March and 18.8 million km^2 in September each year.[226] The Antarctic Treaty seems to place the ice shelves more in the territorial category of land than as part of the high seas.[227] The problems of ice shelves are not specifically covered by UNCLOS, but the

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[222] UNCLOS, Article 56 (1) (b).
[223] UNCLOS, Article 58.
[224] See Appendix I, Article VI.
[225] Discussed by Christopher C. Joyner, "The Exclusive Economic Zone and Antarctica: The Dilemmas of Non-Sovereign Jurisdiction", *Ocean Development and International Law*, 19, 1988, pp.469-491, and in Kaye, Stuart and Rothwell, Donald R., 'Australian Law in Antarctica', *Polar Record*, 29 (170), 1993, pp.215-218. An Australian Parliamentary Committee's Report on the application of Australian law in the AAT recommended establishing an EEZ adjacent to the AAT despite the problems this might cause with other ATCPs.
[226] Christopher C. Joyner, *Antarctica and the Law of the Sea*, Martinus Nijhoff Publishers: Dordrecht, 1992, p.79.
[227] Arthur Watts, op. cit., p.118.

provisions dealing with deltas that change over time could potentially be applied.[228] If New Zealand made an EEZ claim in the Ross Sea, a large part of it would under the ice for part of the year.

The security aspects of the outstanding sovereignty issues have been dealt with in detail elsewhere.[229] It is worth noting that traditional solutions for military security problems are not very relevant to the resolution of environmental security problems and these issues should not be confused. The modern era is one of growing interdependence, and the transnational dimensions of environmental problems mean that traditional concepts of security should be re-examined. While the problems of the environment do form a collective security risk, it is not a threat that the military can actually combat, different methods are required, such as multilateral diplomacy.

Global Environmental Macro-Trends

Before the 1970s environmental problems were often seen as relatively minor issues, but their importance had been growing as scientific understanding of the human impact on the biosphere improved. The intensity of modern resource exploitation has serious socio-economic and human costs, and these problems can not be solved by unilateral actions from states. This has led to increased international cooperation over environmental issues. The 1972 UN Conference on the Human Environment in Stockholm led to the Stockholm Declaration that symbolised the emergence of international environmental law. The emergence of global environmental politics is due to the rise of the transnational environmental movement, and the publicity accorded to global environmental threats such as the hole in the ozone layer over Antarctica. Since the 1992 UN Conference on the

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[228] UNCLOS, Article 7 (2). "Where because of the presence of a delta and other natural conditions the coastline is highly unstable, the appropriate points may be selected along the furthest seaward extent of the low-water line and, notwithstanding subsequent regression of the low-water line, the straight baselines shall remain effective until changed by the coastal State in accordance with this Convention."

[229] See Laurie Barber, "Keeping New Zealand's Back Door Closed", *New Zealand International Review*, 7 (3), 1982, pp.13-14, Dillon Burke, *The Possibility of Conflict in Antarctica: The 1990s and Beyond*, MA Thesis, University of Waikato, 1997, and J.V. Johnson, "An Examination of the Military Implications of Australia's Continued Claim to a Large Part of Antarctica", *Australian Defence Force Journal*, 99, 1993, pp.13-24.

Environment and Development (UNCED) at Rio, the environment is now a central political issue ranking alongside the economic and security issues.[230]

Human population growth and the commensurate economic growth are two of the major gross physical changes driving global environmental problems. In 1999 the estimated world population passed the six billion mark,[231] and one estimate of world population in 2028 is that it will reach ~ eight billion, and be over nine billion by 2048.[232] The current world population growth rate is 1.26%, although this is estimated to be reducing over time to 0.97% in 2015, and 0.78% in 2025.[233] This population growth is occurring mostly in the developing countries. Increasing population has many flow on effects such as intensive farming causing soil degradation, deforestation from logging and subsistence farming, and urbanisation.[234]

Another key change has been the increase in energy consumption, as much as four and half times from 1950-1985.[235] As the economies of developing countries continue to grow so will energy use. Carbon emissions could increase the 'greenhouse effect' leading to a possible temperature rise of between 1.5°-4.5° C by 2030.[236] The rising temperature may already be having an effect on the ice shelves of Antarctica.[237] Emissions of sulfur dioxide have caused 'acid rain' and waldsterben (forest death). The emission of chlorofluorocarbons into the upper atmosphere has caused a 2% loss of Ozone per decade outside the tropical regions since the 1970s. This hole in the Ozone layer has been most noticeable in the Antarctic.

Important as these issues are they lie beyond the scope of this work, which will concentrate more on endangered resources and the 'Tragedy of the Commons'.[238] One other significant global macro-trend has been the rising role of Non-governmental organisations (NGOs) in

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[230] After Gareth Porter and Janet Welsh Brown, *Global Environmental Politics*, 2nd edition, Westview Press: Boulder, Colorado, 1996, pp.1-2.
[231] US Census Bureau, http://www.census.gov/cgi-bin/ipc/popclockw, site visited on 9 February, 2000. The UN 6 Billion Day was on 12 October 1999. http://www.unfpa.org/modules/6billion/en/index.htm, site visited on 9 February, 2000.
[232] http://www.census.gov/ipc/www/worldpop.html, (site visited on 9 January, 2001)
[233] http://www.census.gov/ipc/www/worldpop.html, (site visited on 9 January, 2001)
[234] Gareth Porter and Janet Welsh Brown, op. cit., pp.4-5 and p12.
[235] ibid., p.6.
[236] ibid., p.7.
[237] http://www.asoc.org/currentpress/0407nsidc.htm, site visited on 9 February, 2000.
[238] Garrett Hardin, "The Tragedy of the Commons", *Science*, 162, 1968, pp.1243-1248.

environmental affairs. This growth in activity and prominence has been mirrored within the ATS.

Global fisheries

One great area of stress on the global environment is from overfishing. In the 1950s and 1960s, total world marine fisheries production increased on average by as much as 6 percent per year, doubling from 17 million tonnes in 1950 to 34.9 million tonnes in 1961, and doubling again in the following two decades to reach 68.3 million tonnes by 1983. During 1995-96 total world fish production reached 121 million tonnes. In 1996 94.6 million tonnes of this was from marine capture fisheries, the other 26.38 million tonnes was from aquaculture.[239] Fisheries have generally levelled out or declined. The main fishing areas in the Eastern Pacific and Atlantic Oceans appear to have reached their maximum potential as "wild fisheries are reaching their natural limits".[240] Distant water fisheries have declined with the collapse of the Soviet Union, Japan is the most active in this area, taking 668,000 tonnes in 1996.

A significant component of the fishing problem is the over-capacity in the world fishing fleet. This situation has resulted from investors purchasing more fishing vessels to increase their returns, even after an optimal size is reached for their fishing fleet. Government subsidies supporting the purchase of new vessels and the rehabilitation of old vessels also play a role, although this may be a declining trend.[241]

> Fishers have recently spent nearly $124 billion to catch $70 billion worth of fish. Governments financed the difference of $54 billion largely with low interest loans and direct subsidies for boats and operations – an expenditure that encouraged over-fishing.[242]

This threatens the sustainability of fishing stocks. As local stocks collapse one possible effect is that this capacity is displaced to parts of the world which have not been

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[239] FAO, *The State of World Fisheries and Aquaculture 1998*, Part 1, World Review of Fisheries and Aquaculture, 1998. http://www.fao.org/docrep/w9900e/w9900e00.htm (site visited 9 January 2001).
[240] Stan Crothers Deputy Director, Ministry of Fisheries "Trends and Discontinuities in Fisheries", in *Antarctic 2010; a notebook: Proceedings of the Antarctic Futures Workshop 28-30 April 1998.* Graeme Tetley (editor) Christchurch: Antarctica New Zealand, 1998, (Antarctica New Zealand miscellaneous series no.3.), p.14.
[241] FAO, op. cit.
[242] Stan Crothers, op. cit., p.16.

overfished, such as the Indian Ocean, Western Pacific Ocean, and now the Southern Ocean. Another possible effect is economic retrenchment, for example "Almost 50,000 Canadian fishers were laid off in 1992 and 1993 due to vanishing cod stocks in North Atlantic waters".[243] After almost 500 years of fishing, Canadian Cod had become commercially extinct, economically unviable even if not biologically extinct.[244]

Attempting to control fishing capacity is difficult. Accurately measuring the fishing capacity of vessels requires careful evaluation. Reducing capacity in one fishing stock may displace vessels to another fishery, so efforts must be made to reduce aggregate fishing capacity. In the late 1990s the expansion of fishing fleets appears to be slowing down. China is a significant contributor to the expansion, increasing its fleet from ~ 60,000 to 460,000 decked fishing vessels between 1980 and 1997, and without this the size of the world fishing fleet would have remained stable.[245] Technological change can drastically affect fishing capacity and needs to be carefully monitored. For example, the shift from shore based whaling stations to factory ship (or pelagic) whaling in the 1920s increased whale harvests, and reduced the ability of coastal states to control and regulate the whaling industry.

International agreements and the high seas

The open access areas of the high seas create further difficulties. The UNCLOS regime deals with matters relating to the law of the sea. It was signed 10 December 1982 after more than fourteen years work involving 150 countries, and it was finally ratified 16 November 1994. Although it deals with a vast variety of issues, such as limiting the breadth of the territorial sea to twelve nautical miles,[246] UNCLOS largely ignores the issue of fishing capacity, being more concerned with the prospect of mining the international seabed for mineral resources. Part VII, Section II Articles 116 to 120 cover the right to fish the high seas and the duty of states to adopt and comply with conservation measures. These duties are not elaborated in any great detail. The protection and preservation of the marine environment is also covered in Part XII but this is mostly concerned with pollution.

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[243] ibid., p.14.
[244] Mark Kurlansky, *Cod: A Biography of the Fish That Changed the World*, Cox & Wyman Ltd: Reading, 1999, p.186.
[245] FAO, op. cit.
[246] UNCLOS, Article 3.

The UNCLOS regime endorses the principle of flag state jurisdiction over vessels on the high seas. A related principle is slowly evolving, that "the exclusive jurisdiction over high seas fishing vessels enjoyed by flag States necessarily implies a corresponding duty."[247] One example of this is the 1993 FAO Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas (FAO Compliance Agreement). It is the legally binding part of the Code of Conduct for Responsible Fisheries, which elaborates a set of specific duties for flag states to ensure that their vessels do not undermine conservation rules.

A subsidiary agreement to UNCLOS, the UN Agreement for the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (UNIA), was signed 4 December 1995 but is not yet in force.[248] "The objective of this Agreement is to ensure the long-term conservation and sustainable use of straddling fish stocks and highly migratory fish stocks".[249] The area of application is both within and beyond the area of national jurisdiction, subject to the existence of other legal regimes.[250] It did introduce more fully such concepts such as precautionary management into the UNCLOS regime.[251] UNIA is only a partial step towards attempting to regulate the high seas as it does not cover species that exist completely beyond national jurisdiction. If UNIA enters into force, then there will be a review conference after four years to "review and assess the adequacy of the provisions of this Agreement and, if necessary, propose means of strengthening the substance and methods of implementation of those provisions".[252] The procedure used in negotiating would probably be one where consensus was sought, and voting resorted to only if consensus could not be achieved.[253]

Compliance with UNIA is dependent mostly on the actions of the flag state of a vessel, but some attention is also given to the role that port states can play.[254] UNIA Article 18 and 19

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[247] David Balton, *Dealing With the 'Bad Actors' of Ocean Fisheries, Address at Conference on Fisheries Management, Norway Graduate School of Economics*, Bergen, Norway, May 20, 1999, http://www.state.gov/www/policy_remarks/1999/990520_balton_fisheries.html (site visited 11 October 2000).

[248] There are 59 signatories so far to UNIA but only 27 ratifications. 30 ratifications are required for UNIA to enter into force. See http://www.un.org/Depts/los/los164st.htm (site visited 22 March 2001).

[249] UNIA, Article 2. The full text of the convention can be found at gopher://gopher.un.org/00/LOS/CONF164/164_37.TXT (site visited 11 February, 2000).

[250] UNIA, Article 3 (1).

[251] UNIA, Annex 2.

[252] UNIA, Article 36 (2).

[253] UNIA, Article 45 (2).

[254] UNIA, Articles 19-23.

is similar to the FAO Compliance Agreement, but goes a step further. In Article 8 (3) and (4) states whose vessels fish in an area regulated by a regional agreement should either join the organisation or apply the organisation's restrictions to their flag vessels. Secondly, regional organisations shall have open membership to all interested states. Finally, only Member states shall have access to the regulated fishery. Article 17 notes that states which do not join or apply restrictions are not discharged from their obligation to cooperate with other states, and in particular they must not authorise their vessels to fish for regulated stocks. Articles 21 and 22 allow states to board and inspect vessels, and to take limited enforcement action to prevent violations of agreed fishing restrictions.

UNIA retains the principle that no other state can take action against a fishing vessel on the high seas without the consent of the flag state, but such consent can now be given in advance by becoming a party to UNIA. This gives other responsible states limited enforcement authority. This has been negotiated in some smaller scale agreements previously. For example, the 1994 Convention on the Conservation and Management of Pollock Resources in the Central Bering Sea, (or the 'Donut Hole' agreement).[255] One problem is that many states are still willing to flag vessels over which they exercise no practical control.[256] 'Soft law' is still developing here, for example the following UN General Assembly Resolution 54/32 was adopted by consensus on 24 November 1999 and in part:

> 6. Calls upon all States to ensure that their vessels comply with the conservation and management measures in accordance with the [UNIA] agreement that have been adopted by sub-regional and regional fisheries management organizations and arrangements;
>
> 7. Calls upon States not to permit vessels flying their flag to engage in fishing on the high seas without having effective control over their activities and to take specific measures to control fishing operations by vessels flying their flag;[257]

David Balton commented that "If flag states do not fulfil these responsibilities, the international community will have no choice but to look for other ways to control

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[255] See Lawrence Juda, *International Law and Ocean Use Management*, Routledge: London and New York, 1996, pp.261-267.

[256] David Balton, *Making the New Rules Work: Implementation of the Global Fisheries Instruments, Remarks Delivered at the Conference on Current Fisheries Issues and the Food and Agriculture Organization of the United Nations*, Rome, Italy, March 16-17, 2000, http://www.state.gov/www/policy_remarks/2000/ (site visited 11 October 2000).

irresponsible fishing vessels on the high seas. The exclusive jurisdiction that flag states enjoy over such vessels will be in jeopardy."[258]

Both UNCLOS and UNIA make reference to regional treaties and organisations. UNCLOS does "not alter the rights and obligations of States Parties which arise from other agreements"[259] and state parties to UNCLOS can conclude new agreements that suspend or modify parts of UNCLOS that are not incompatible with the basic principles, object and purpose of UNCLOS.[260] The application of UNIA is subject to "the different legal regimes that apply within areas under national jurisdiction and in areas beyond national jurisdiction".[261] CCAMLR is acceptable as an example of a regional organisation under UNCLOS. This means that the Commission remains the main forum for decision-making concerning the Southern Ocean. CCAMLR has invited observers from other regional fishing organisations to attend its meetings.[262] This builds links between different organisations and facilitates the exchange of information and ideas.

The FAO is attempting to develop an International Plan of Action (IPOA) on IUU. The first technical meeting to prepare a draft IPOA was held in October 2000 in Rome. The IUU IPOA might be finalised in 2001. Another IPOA is being developed to address the problem of over-capacity. The 1980s saw the depletion of key fish stocks around the globe. In the 1990s the international community has responded by negotiating a series of forward looking instruments and a variety of regional regimes. In 2000 the era of big negotiations is over and it is time to implement the agreements.[263] There is a need to place a cap on oceanic harvesting, and to reduce over-capacity. One source of over-capacity and overfishing is government subsidies of marine fishing fleets. There is a need to examine the policies of the World Bank and other institutions that in the past have focused on strengthening economies, they now need to be concerned with conservation and sustainability.[264]

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[257] The full resolution can be found at http://www.un.org/Depts/los/r54_32e.htm (site visited 26 February, 2001).
[258] David Balton, op. cit.
[259] UNCLOS, Article 311 (2).
[260] UNCLOS, Article 311 (3).
[261] UNIA, Article 3 (1).
[262] For example at CCAMLR XVII in 1998 observers from the Commission for the Conservation of Southern Bluefin Tuna (CCSBT) and the IWC attended the meeting.
[263] David Balton, op. cit.
[264] Frank E. Loy, *Keynote Address at the Conference on Current Fisheries Issues, Co-hosted by the Centre for Oceans Law and policy, University of Virginia School of Law and the Food and Agriculture Organization*

Marine Exploitation in the Southern Ocean

The main exploitation of resources in the Southern Ocean has been of the marine life. The prospect of harvesting icebergs for their fresh water has attracted some attention, but this is yet to eventuate. Although whales and seals are no longer being exploited their historical boom-bust cycle has been repeated by the modern fishing industry in the Southern Ocean, both before and after CCAMLR entered into force. Seals will not be covered, because seal exploitation is not currently a major issue. Whaling will be covered briefly as although it is a current international issue, its problems fall outside the ambit of CCAMLR. Finfish exploitation will be covered, but the history of the exploitation of the Patagonian toothfish will be left to Chapter 4.

Whaling in the Southern Ocean

Issues involving the harvesting of whales have largely been kept outside the ATS because whaling was covered by an existing agreement when the Antarctic Treaty was signed.[265] This agreement was the 1931/1946 International Convention for the Regulation of Whaling.[266] This gap in the environmental protection of the Southern Ocean provided by the ATS has continued to the present day. The Agreed Measures on Flora and Fauna expressly excluded whales from its definition of "native animal".[267] Attempts at regulating the whaling industry after the Second World War by the International Whaling Commission (IWC) failed. There were too many ships chasing an ever decreasing number of whales.[268]

Whales are an important part of the ecosystem of the Southern Ocean. This has meant that CCAMLR has taken some responsibility for the conservation of whales. This duplication is accommodated by recognition of the rights and obligations of contracting parties under the

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of the United Nations, Rome, Italy, March 16, 2000. http://www.state.gov/www/policy_remarks/2000/ (site visited 11 October 2000).

[265] See also Chapter 3, pp.61-62.

[266] States that are currently members of the IWC include: Antigua and Barbuda, India, Russian Federation, Argentina, Ireland, Saint Kitts and Nevis, Australia, Italy, Saint Lucia, Austria, Japan, Saint Vincent and The Grenadines, Brazil, Kenya, Senegal, Chile, Republic of Korea, Solomon Islands, People's Republic of China, Mexico, South Africa, Costa Rica, Monaco, Spain, Denmark, Netherlands, Sweden, Dominica, New Zealand, Switzerland, Finland, Norway, UK, France, Oman, USA, Germany, Peru, Venezuela, and Grenada.

[267] Agreed Measures on Flora and Fauna, Article II (a).

[268] See Chapter 3, note 30, p.62.

International Convention for the Regulation of Whaling.[269] The Commission and Scientific Committee are required to cooperate with the IWC.[270] For some time it was thought that the decline of baleen whales in the Southern Ocean would result in a surplus of krill for harvesting, but as scientific understanding of the Southern Ocean ecosystem has improved this 'krill surplus hypothesis' has evaporated.[271] Whales are now included under the Madrid Protocol in the updated version of the Agreed Measures.[272]

Whaling in the Southern Ocean continues today under the guise of taking whales for the purpose of scientific research. The IWC has declined Japanese proposals for minke whales to be taken by coastal-community whaling and has passed a resolution calling on the Japanese government to refrain from issuing permits to continue their scientific programme.[273] The issuance of these permits is a sovereign right under the Whaling Convention and Japan has taken nearly 5,000 whales in the last twelve years.[274] Whaling is also permitted for aboriginal subsistence, but this is unlikely to prove to be an issue in the Southern Ocean and no catch limits for this purpose exist there.

Whaling in the Southern Ocean sanctuary is strongly opposed by environmental groups. In 2000 the New Zealand government was prompted to complain officially to Tokyo in response to the aggressive tactics of the whalers responding to the Greenpeace activists shadowing their ship in the Southern ocean.[275] The anti-whaling opinion was strongly expressed by the New Zealand Prime Minister Helen Clark:

> The New Zealand government does not accept Japan's contention that it is whaling for scientific purposes. It is well known that meat from the whales slaughtered under the so-called Japanese Whaling Research programme ends up for commercial sale in Japan itself.[276]

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[269] Christoper C. Joyner, *Governing the Frozen Commons: The Antarctic Regime and Environmental Protection*, University of South Carolina Press: Columbia, South Carolina, 1998, n69, p.318. See also Appendix II, Articles VI and XXII.
[270] Appendix II, Article XXIII (3).
[271] Christoper C. Joyner, op. cit., pp.143-144.
[272] Madrid Protocol, Annex II, Article 1 defines native mammal in a way that includes whales. However Article 7 reaffirms that "Nothing in this Annex shall derogate from the rights and obligations of Parties under the International Convention for the Regulation of Whaling."
[273] Final Press Release, 1999 IWC Meeting, St George's, Granada, 28 May 1999, http://ourworld.compuserve.com/homepages/iwcoffice/Press99.htm (site visited 14 February, 2000).
[274] "Clark Supports Greenpeace: Japan Whaling 'Deplorable", *The Press*, Christchurch, 20 January, 2000, p.8.
[275] "Whaling Damages Japan", *The Press*, Christchurch, January 17, 2000, p.4.
[276] "Clark Supports Greenpeace: Japan Whaling 'Deplorable", *The Press*, Christchurch, 20 January, 2000, p.8.

Greenpeace has argued that the whaling is in violation of UNCLOS Articles 117-120, which require contracting parties to abide by regional fisheries codes – in this case the IWC Southern Ocean Sanctuary. There is a possible legal case to test this based on the precedent of bluefin Tuna,[277] however this might not work because the Whaling Convention does permit a catch for scientific study.[278]

Fishing in the Southern Ocean before CCAMLR

Extensive exploratory fishing for finfish and krill in the Southern Ocean was not conducted until the mid-1960s.[279] The main reason for the initiation of harvesting was that long-range fishing fleets from the then Eastern Bloc countries were being displaced from waters elsewhere as a result of the developing Law of the Sea negotiations.[280] These fishing fleets were largely independent of port facilities and their activities were also subsidised by their governments. This facilitated fishing in waters that were at that time uneconomic for vessels from countries with market economies.[281] Until the collapse of the Soviet Union in 1990 they were responsible for the greater proportion of fishing operations in the Southern Ocean. Although krill remained the dominant harvested species, several other species of marine life in the Southern ocean were exploited from the 1969/70 split year onwards. Other important commercial species included lanternfish (myctophids including *Electrona carlsbergi*), mackerel or Antarctic icefish (*Champsocephalus gunnari*), marbled rockcod (*Notothenia rossii*), Patagonian rockcod (*Patagonotothen guntheri*) and Patagonian toothfish (*Dissostichus eleginoides*).[282] The smaller fish, such as Gunther's notothenia and lanternfish, were used for fish meal while larger species used for direct human consumption.[283]

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[277] Australia and New Zealand filed a request with the International Tribunal for the Law of the Sea July 30 1999 seeking provisional measures for the Southern Bluefin Tuna, asking for an injunction against Japan's experimental fishing of Southern Bluefish Tuna. The Tribunal ordered that the three parties should refrain from conducting experimental fishing without the approval of all three parties.
For the Tribunal's Order see http://www.un.org/Depts/los/ITLOS/Order-tuna34.htm and also the Press Release http://www.un.org/Depts/los/Press/ITLOS/ITLOS_28.htm (both sites visited 18 February, 2000).
[278] "Whaling damages Japan", *The Press*, Christchurch, January 17, 2000, p.4.
[279] Karl-Hermann Kock, op. cit., p.3.
[280] ibid.
[281] ibid.
[282] There is a third toothfish species *Gvozdarus svetovidovi*, but it is very rare.
[283] Karl-Hermann Kock, op. cit., p.4.

CCAMLR had its origins as a krill treaty, when there appeared to be the possibility of a krill surplus that could be as much as double the world fish supply.[284] This krill surplus has not eventuated. The gap in the ecosystem that was previously filled by whales before their population was reduced by over-harvesting have been filled by other predators.[285] Krill is central to the food chain in the Southern Ocean, and its circumpolar standing stock is generally estimated at around 500 million tonnes, although there remains a large uncertainty over the production estimates for krill. Krill fisheries are closely monitored because vessels target krill aggregations on the shelf or at the shelf break, in many cases close to the breeding sites of land-based krill predators such as penguins. Concern has been expressed within CCAMLR that krill catches in those areas may affect predators by locally depleting their food source. The interaction between krill fisheries and land-based krill predators is being researched under the CCAMLR Ecosystem Monitoring Program (CEMP). Krill is the foundation of the ecosystem of the Southern Ocean, as such anything that effects the krill will impact on the rest of the ecosystem of the Southern Ocean.

The commercial harvest of krill began in 1972, and annual catches exceeded 300 000 tonnes in most years from 1980 to 1992, then decreased to between 80 000 and 100 000 tonnes.[286] Krill also turned out to be difficult to harvest, process, and market. Krill had to be processed quickly to prevent fluoride in the chitin from contaminating the flesh. The lack of a consumer market for krill saw a large proportion of the harvests being used for animal meal.[287] Catches peaked at 425 870 tonnes in 1985/86 when the fishery contributed approximately 13% of the global annual catch of crustaceans, and the recent low catches reflect a decrease in the worldwide demand for krill rather than overfishing. The decline in krill catches following 1992 was attributed to economic factors, a shift in fishing effort from krill fisheries to finfish fisheries, and the break-up of the Soviet Union which until then had dominated the fishery; the decline was not due to overfishing. The fishery has

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[284] P. J. Beck, *The International Politics of Antarctica*, Croom Helm Ltd: London, 1986, p.214. Japan and Russia started harvesting krill in the 1960s, with other countries joining in the 1970s.

[285] For some of the ecological responses to commercial exploitation see Karl-Hermann Kock, "Present Knowledge of Antarctic Marine Living Resources and Means of Ensuring the Compliance with Protective measures", in Wolfrum, Rüdiger (ed), Klaus Bockslaff and Ingrid L. Jahn (asst. eds), *Antarctic Challenge II: Conflicting Interests, Cooperation, Environmental Protection, Economic Development: Proceedings of an Interdisciplinary Symposium September 17th-21st 1985,* Duncker & Humblot: Berlin, 1986, pp.57-58.

[286] Karl-Hermann Kock, *Understanding CCAMLR's Approach to Management*, May 2000, p.6.

[287] Dietrich Sahrhage, "Fisheries Overview", in Lewis M. Alexander, and Lynne Carter Hanson (eds), *Antarctic Politics and Marine Resources: Critical Choices for the 1980s: Proceedings from the Eighth Annual Conference Held June 17-20, 1984 Centre for Ocean Management Studies University of Rhode Island*, Kingston Rhode Island: Centre for Ocean Management Studies, 1985, pp.101-112.

operated mainly in the South Atlantic, around the South Shetland Islands and South Orkney Islands in summer, and adjacent to South Georgia in winter. Recent advances in harvesting and processing technology, and the development of pharmaceutical products based on krill, may lead to a resurgence of the krill fisheries. In 1999 the United States indicated that it might participate in the krill fishery for the first time and there is a rising number of states participating in krill harvesting.[288]

The Soviet Union commenced large-scale harvesting of fin-fish in the 1969/70 season, and was joined in the mid-70s by Poland, the German Democratic Republic (GDR), and Bulgaria. At the end of the 1971/72 season three species were being harvested, *N. rossii*, *Notothenia squamifrons* (the scaled notothenia), and *C. gunnari* (the Antarctic icefish).[289] Reported catches in the fishery for marbled rockcod peaked at 399,700 tonnes in 1969/70, then declined to 101 560 tonnes in 1970/71, and 2,740 tonnes in 1971/72 as the stock was overfished and the fishery collapsed. Directed fishing on rockcods has been prohibited since 1985, and the recovery of stocks which were overfished in the late 1960s and early 1970s is being monitored. Midwater trawling for mackerel icefish started in the early 1970s, and this fishery was characterised by peaks of intense fishing followed by periods of low catches and possible localised depletion from the mid-1970s to the late 1980s. Stocks of icefish are believed to undergo large natural variations in their abundance, and commercial fishing for this species is restricted to peaks in abundance.[290]

Fishery grounds yielded good catches for a few years, but the catches declined rapidly in the early 1980s.[291] "Finfishing paralleled the history of whaling in the Southern Ocean, but on a much shorter time scale, with successive discovery, exploitation, and depletion of each new stock."[292] Large-scale exploitation and depletion of many fish stocks preceded CCAMLR.[293] The depletion of Finfish stocks paralleled whaling, but on a much shorter time scale, the lanternfish fishery ceased 1991/92.[294] The only viable fishery remaining

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[288] CCAMLR-XVIII, 4.4, p.7.
[289] Matthew Howard, op. cit., at pp.109-110.
[290] After CCAMLR, information from the Scientific Committee's Fisheries Monitoring section at the CCAMLR web page, www.ccamlr.org, (site visited 22 March 2001).
[291] Karl-Hermann Kock, op. cit., p.4.
[292] ibid., p.5.
[293] ibid., p.3.
[294] ibid., p.5.

from those undertaken prior to CCAMLR is that for mackerel icefish.[295] CCAMLR inherited a situation where finfish stocks were already depleted and exploitation of the remaining stocks was continuing. Krill was being exploited, but not at levels that were a cause for immediate concern. In the 1980s fishing had to be subsidised to be a viable industry. In the 1990s economic difficulties have meant that the subsidised fishing is no longer viable in the Southern Oceans. In the 1990/91 season Chile started long-lining for Patagonian toothfish.[296]

Summary

The Southern Ocean was the last major ocean to be explored and exploited. Whale, seal, and some finfish stocks were severely affected before the entry into force of the CCAMLR regime. The achievements of the IGY and the negotiations leading to Antarctic Treaty and the subsequent establishment of the ATS have established a set of principles, norms and values that remain important today. The much vaunted "spirit of cooperation" conceals the political reality of constant compromise that is required to maintain the ATS. When CCAMLR was established it was hoped that its ecosystem approach and precautionary principle would allow it to develop into an effective regime before the ecosystem could be further damaged by unregulated exploitation. The next two chapters will explore how successful CCAMLR was in achieving this goal.

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[295] A. J. Constable, W.K. de la Mare, D.J. Agnew, I. Everson and D. Miller, "Managing Fisheries to Conserve the Antarctic Marine Ecosystem: Practical Implementation of the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR)", Paper presented to ICES/SCOR Symposium on 'Ecosystem Effects of Fishing', 15-19 March, 1999, Montpellier, France, SC-CAMLR-XVIII/BG/26, 23 October 1999.

[296] Karl-Hermann Kock., op. cit., p.5.

Chapter 4

Establishing the Framework of the Convention: Dealing with Uncertainty

Fishing is no longer something that can be considered a recent development in the history of the exploitation of living resources in the Southern Ocean. CCAMLR has now been in force since 1982. This chapter will cover the development of the CCAMLR Regime and the groups important to its development up into the early 1990s. The consensus system and the decision-making procedures will be closely analysed. Three key areas of development will then be discussed: the development of the relationship between the Commission and the Scientific Committee; the development of a framework of conservation measures, and the development of a system of observation and inspection. An assessment of CCAMLR in the early period will be presented with conclusions as to how successful it was in implementing the Convention.

The CCAMLR Negotiations: Impact on Implementation

The outcomes of the negotiations leading to CCAMLR had a deep and fundamental impact on the operation of the CCAMLR regime.[1] The negotiations for CCAMLR were carried out secretly by the ATCPs, and largely excluded input from third-party states, fishing operators, or non-governmental organisations.[2] Despite this many commentators, such as Fernando Zegers, considered the regime achieved an effective one in part because it was acceptable to all of the Consultative Parties as well as the international community.[3] The problem of participation in CCAMLR was one that would occur in different shapes, as the Contracting Parties considered how best to include the European Community, non-governmental organisations such as ASOC and Greenpeace, and how to involve third-party states.[4]

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[1] See Chapter 3, pp.72-77 for more background on the CCAMLR negotiations.
[2] The secrecy of the CCAMLR negotiations makes it difficult to speculate on exactly what role was played by the fishing industry. During the negotiations arguments favouring fishing were presented by states already involved in Southern Ocean fishing, notably Japan and the USSR, while arguments favouring conservation were led by the United States. James N. Barnes, op. cit., passim.
[3] Fernando Zegers, "The Canberra Convention: Objectives and Political Aspects of its Negotiation", in Vicuña, Francisco Orrego, *Antarctic Resources Policy: Scientific, Legal, and Political Issues*, Cambridge University Press: Cambridge, 1983, p.153.
[4] See Chapter 4, pp.113-115, and pp.117-122.

CCAMLR contained several important compromises, such as the ambiguity of coastal state jurisdiction, but what was left out of the Convention was in many ways as important as what was left in the Convention. The Convention did not deal explicitly with such things, *inter alia*, as economic use of resources, the granting of fishing permits, and the jurisdiction of coastal states. These issues would have to be dealt with by CCAMLR at a later date before the Convention could begin effectively dealing with the problems of the Southern Ocean. One notable gap in the initial framework was the lack of a system for observation and inspection.[5]

Although the CCAMLR approach was hailed as innovative it was still built on ideas and institutions that had already been developed. The solutions to many of the problems facing the negotiators were adapted from the Antarctic Treaty. The problem for CCAMLR was going to be in implementing the framework required to meet this ecosystem objective. A crucial element was going to be the role of the Scientific Committee and its provision of scientific advice to the CCAMLR Commission. The successful CCAMLR negotiations set precedents that encouraged the CRAMRA negotiations. Those negotiations ultimately failed and the ATCPs developed a different approach to mineral resource exploitation with the Madrid Protocol.[6] A consequences of that failure has been to leave CCAMLR as the main element of the ATS regime dealing with the exploitation of resources. The issue of cooperation with other elements of the ATS and other intergovernmental organisations is one which would grow in the 1990s.

The boundary area of the Convention

CCAMLR is a regional fisheries agreement with an imperfect boundary delineating its area of application. The area of geographic application for the CCAMLR regime is described as including the waters south of the Antarctic convergence. The convergence is considered to the boundary of the area in which the ecosystem of the Southern Ocean is to be found. In practice some compromises were made on the area of application. The exact boundaries of the convergence, as measured by salinity and temperature, change periodically.[7] This means that it changes seasonally and it would have been difficult to encompass the

[5] See Chapter 4, pp.152-156 for details on the development of the system of observation and inspection.
[6] See Chapter 3, pp.77-82.
[7] James N. Barnes, op. cit., p.261.

maximum possible extent of the convergence within the boundary of the Convention Area. Fortunately the Convention Area was not circumscribed at 60° South latitude as that would have been "practical and biological nonsense."[8]

The boundary does not include some waters that ought to fall within the Convention Area. Argentina protected its interests in the Drake Passage area by insisting during the CCAMLR negotiations that the convergence boundary line be farther away from Argentine territory.[9] In addition to this the question of coastal state jurisdiction has the potential to create a sovereignty dispute in attempting to resolve resource problems. The French statement to the CCAMLR Convention allows the possibility that a significant amount of the Convention Area could be closed to the CCAMLR Commission's jurisdiction.[10] The Kerguélen and Crozet Islands are to the north of 60°South latitude and outside the area of the Antarctic Treaty. "France has unambiguously indicated that it is prepared to prevent Convention conservation measures applying within the EEZ of its Sub-Antarctic islands, thus considerably reducing the ambit of the ecosystem approach."[11] This affects more than just the French possessions, as Australia, Norway, South Africa, and the UK also have Sub-Antarctic island dependencies in the Southern Ocean.

Some species can be found both inside and outside the Convention Area. These straddling stocks cause problems to the application of conservation measures by CCAMLR. Article XI partially addresses this issue by outlining the desirability of harmonised conservation measures. The Antarctic Treaty itself is ambiguous on its application to the high seas requiring that "nothing in the present Treaty shall prejudice or in any way affect the rights, or the exercise of the rights, of any State under international law with regard to the high seas within that area."[12] CCAMLR has to cooperate with states that exercise maritime jurisdiction in its area, and with those IGOs that exercise management responsibilities adjacent to the Convention Area. The issue of cooperation with other regional organisations that operate to the north of the Convention Area was one that increased in importance on the CCAMLR agenda in the late 1990s. For example, incidental mortality in

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[8] John A. Heap, "Has CCAMLR Worked? Management Policies and Ecological Needs", in Arnfinn Jørgensen-Dahl and Willy Østreng, *The Antarctic Treaty System In World Politics*, Fridtjof Nansen Institute: London, 1991, p.46.
[9] James N. Barnes, op. cit., p.262.
[10] ibid., p.257.
[11] F. M. Auburn, op. cit., p.222.
[12] Appendix I, Article VI.

the tuna longlining fisheries north of the Convention Area affected seabirds that live inside the Convention Area leading to exchanges of information between CCAMLR and the International Commission for the Conservation of Atlantic Tunas (ICCAT) and the CCSBT.

A map was designed in 1983 to help implement CCAMLR's conservation system.[13] It was divided into seventeen subareas, and further divisions, on scientific grounds, following lines developed by the FAO in 1970s in part to facilitate the reporting of catch statistics. In 1987 statistical subareas were created around the McDonald and Heard Islands, allowing differentiation of where catches have been harvested.[14] Six statistical subareas have been deemed most critical for finfish conservation attention. These are statistical areas 48.1 (around South Georgia), 48.2 (around South Orkneys), 48.3 (around the South Shetlands and offshore the Antarctic Peninsula), 58.5.1 (around the Kerguélen Islands), 58.4.2 (off Prydz Bay), and 58.41 (in the Eastern Indian Ocean sector). Less critical are the areas 48.5 (Weddell Sea), 48.6 (South-East Atlantic), 58.4.4 (Ob and Lena Banks), 58.4.3 (mid-Western Indian Ocean), 58.7 (around Prince Edward Island), and all of 88 (Pacific Ocean, and Ross Sea).[15]

The assessment of CCAMLR before it entered into force

As a significant regional resource and conservation agreement, as well as being an extension of the ATS, CCAMLR attracted comment from observers as to its merits and flaws as it was signed and proceeded to enter into force. Views ranged from the pessimistic to the optimistic. Two common points of comparison were with CCAS and IWC, the previous Conventions dealing with resource exploitation in the Southern Ocean. CCAMLR was usually deemed as better than CCAS, but the praise was limited. As Watts put it: "These various references to environmental considerations are in marked contrast to the absence of any such references in the Seals Convention. Nevertheless, while demonstrating that their relevance is accepted, they remain essentially peripheral to the substantive content of the convention."[16]

[13] An updated version of this map is on p.ix.
[14] SC-CAMLR-VI, 5.76-5.78, p.37.
[15] Christopher C. Joyner, op. cit., pp.135-138.
[16] Arthur Watts, op. cit., p.263.

The assessments comparing CCAMLR and the IWC were more mixed. CCAS is yet to be put into operation, while IWC has had to deal with the problems of whaling. CCAMLR was to some extent designed with the flaws of the IWC in mind. The lack of scientific information was resolved with the creation of a Scientific Committee. One school of thought was that CCAMLR had addressed the participation problem of IWC by restricting membership to states active in research and/or harvesting of the resources, thus preventing the problems in the IWC when many conservation minded states joined without expending any effort in research or harvesting of whales.[17] Others felt that the CCAMLR negotiators had not learnt from IWC: "From the viewpoint of conservation, it would appear that the draftsmen took one of the most criticised features of the Whaling Convention and then made attainment of the objective even more difficult by adding the Antarctic Treaty practice of unanimity."[18] The ambit of CCAMLR includes whales but it has chosen to leave the management role to the IWC, while cooperating in the information analysis required for understanding the ecosystem of the Southern Ocean.

Environmental NGO criticism noted among other things the lack of flag state enforcement measures, or of an obligatory dispute resolution mechanism. Auburn criticised CCAMLR for the lack of any national allocations – considering single unallocated quotas useless, and for the lack of any reference to the possibility of a moratorium.[19] Auburn predicted that research funding would tend to favour species being harvested, or with that potential,[20] and that "In practice the Convention will become a fisheries management treaty dominated by the interests of the harvesting states."[21] Beck, making a wider appreciation of the ATS search for consensus, was more optimistic in his assessment: "predictions of discord may prove both premature and unduly pessimistic."[22]

The future of CCAMLR would depend on the interaction of fishing and conservationist interests, plus the contribution of marine research. Auburn's view was that if "the Convention is to be more than a traditional fisheries regime, the central issue will be the

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[17] J. A. Gulland, "The Antarctic Treaty System as a Resource Management Mechanism – Living Resources", in Polar Research Board, Commission on Physical Sciences, Mathematics, and Resources, National Research Council, *Antarctic Treaty System: An Assessment*, National Academy Press: Washington, D.C., 1986, pp.224-226, and p.230.
[18] F. M. Auburn, op. cit., p.227.
[19] ibid., p.228.
[20] ibid., p.229.
[21] ibid., p.240.
[22] P. J. Beck, op. cit, p.231.

extent to which the conservation principles can be translated into effective decisions of the Commission."[23] Many doubts were expressed at the ability of the regime to do this against the interests of fishing nations. "Any clash between harvesting interests and conservationists seeking implementation of the ecosystem principles with respect to an issue seen to be important to the fishing nations is likely to be decided in favour of the harvesters."[24] As Edwards and Heap observed:

> The primary difficulty in designing institutions to fulfil the objectives of a conservation convention such as this is to provide adequately for situations where there is legitimate room for doubt as to the course of action which would more properly serve the purposes of the Convention.[25]

If CCAMLR was not designed in a manner that could overcome this problem easily, then it would have to adapt itself to the situation as time progressed and the problems became apparent. CCAMLR had the capacity to evolve into an effective regime, the salient question was whether or not this would be the case in the 1980s. The underlying desire once CCAMLR was signed was to implement it as quickly as possible, and a meeting was held in 1981 to establish the institutional framework even though the Convention was yet to enter into force. When CCAMLR was signed the extent of the marine resources of the Southern Ocean remained highly speculative, which was just one more indication of the size of the task that faced the fledgling organisation. John Rowland observed of CCAMLR that it was "an agreement which may not be perfect but is usually considered a good deal better than nothing".[26]

Fishing in the Southern Oceans During the Early Years of CCAMLR

The CCAMLR negotiations took place after some Southern Ocean finfish species stocks had already been depleted.[27] They might not have been so depleted if EEZ had not been established by coastal states elsewhere.[28] When CCAMLR entered into force the fisheries

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[23] F. M. Auburn, op. cit., p.238.
[24] ibid., p.239.
[25] David M. Edwards and John A. Heap, "Convention on the Conservation of Antarctic Marine Living Resources: A Commentary", *Polar Record*, 20 (127), 1981, p.356.
[26] Stuart Harris (ed), *Australia's Antarctic Policy Options*, Centre for Resource and Environmental Studies, Australian National University, 1984, p.357.
[27] See Chapter 3, pp.98-101.
[28] Peter D. Oelofsen, Alexandre Kiss, James Barnes, and Yoon Kyung Oh, "Panel Discussion on Living Resources", in Polar Research Board, Commission on Physical Sciences, Mathematics, and Resources,

it was dealing with were limited to krill and finfish. Seals were not being exploited and were covered under CCAS, and the issue of whaling was being dealt with by the IWC. The new fisheries that were developed after CCAMLR entered into force for crabs, squid, and the Patagonian toothfish will be examined in chapter 5.[29] Although krill was considered important, much of the early attention of CCAMLR was given over to the state of the depleted finfish stocks. This lack of progress with krill attracted some criticism.

Finfish harvesting in the Southern Ocean

There were a dozen or so finfish species with commercial potential in the Southern Ocean. Exploitation was hampered by distance, climate, and the lack of dense, commercially exploitable, shoals of fish. These species were vulnerable to exploitation due to their low fecundity, slow growth and longevity.[30] In 1983 it was noted that a BIOMASS working group had indicated "that fish stocks have been substantially affected by exploitation."[31] At this stage very little was known about the *Dissostichus* spp.

Until 1990 fishing operations in the Southern Ocean were conducted almost entirely by Eastern Bloc countries.[32] The initial management approach taken by CCAMLR in the 1980s was reactionary – it only tried to remedy situations that were obviously bad. In the case of the species that had been exploited before CCAMLR entered into force this was too little, too late. Cessation of lanternfish fishery occurred after the 1991/92 season due to economic considerations. The *N. rossii* stock in Subarea 48.3 which had been heavily exploited before the Convention entered into force was still at a very low level in 1990.[33]

The third meeting of the Scientific Committee began the identification of fish stocks in need of Conservation Measures: *Notothenia rossii marmorata*; *notothenia gibberifrons*; *Champsocephalus gunnari*; and *Dissostichus eleginoides* were considered the most affected. For *N. rossii* around South Georgia "all available evidence was consistent with indicating that this stock is very severely affected by fishing, and that the present biomass

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National Research Council, *Antarctic Treaty System: An Assessment: Proceedings of a Workshop Held at Beardmore South Field Camp, Antarctica, January 7-13, 1985*, National Academy Press: Washington, D.C., 1986, p.241.

[29] See Chapter 5, pp.164-170.

[30] Peter J. Beck, op. cit., p.216.

[31] SC-CAMLR-II, 49, p.10.

[32] Karl-Hermann Kock, op. cit., pp.4-5.

is less than 10% of the initial biomass when the fishery started."[34] Measures proposed to deal with this included closure of the South Georgia fishery, individual species TACs, or global TACs with by-catch provisions.[35] At that time Poland, GDR, and USSR delegations felt that there was not sufficient scientific evidence proving the necessity of application of such measures.[36]

The process of obtaining consensus on the need to adopt more rigorous conservation measures was a slow one. "Fishing countries used traditional arguments – as they have done in almost all regional fishery commissions – that the scientific advice was uncertain due to the lack of adequate information, information that often could be provided only by fishing nations themselves."[37] Conservation minded members preferred to establish a more precautionary approach in the absence of more detailed data, but CCAMLR was unable to strike a balance between the different positions. It was not until 1991 that the depleted species started to be seen to be recovering due to the conservation measures implemented by CCAMLR.[38] Individual efforts rather than collective efforts organised through CCAMLR were producing better results. For example, French management measures played a role in halting the decline of *N. rossii* around the Kerguélen Islands.[39] CCAMLR failed by the end of the 1980s to act to ensure the recovery of finfish stocks that were depleted before it entered into force.

Krill harvesting in the Southern Ocean

Some of the early estimates of the krill biomass placed it at 180 million to 200 million tons, with one optimistic figure derived by the Soviet Union estimating as much as 1,350 million tons.[40] There was a popular conception in the 1970s that owing to the decline in baleen whale stocks there was a surplus of krill, perhaps as much as 60 million tons per year. In 1980 wide variances existed in the estimates of how much krill could be harvested,

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[33] SC-CAMLR-IX, 3.27, p.21.
[34] SC-CAMLR-III, 7.11, p.15.
[35] SC-CAMLR-III, 7.31, pp.18-19.
[36] SC-CAMLR-III, 7.32, p.19.
[37] Karl-Hermann Kock, op. cit., p.11.
[38] CCAMLR-X, 1.7, p.1
[39] SC-CAMLR-V, 4.39, p.14.
[40] F. M. Auburn, op. cit., p.207.

ranging from 5 million to 150 million tonnes per year.[41] The krill surplus was supposedly responsible for the steady increase in population of other krill predators.[42] In 1984 the Scientific Committee acknowledged that there was no direct evidence that this was the case.[43] As understanding of krill biology and the southern ocean ecology has improved "the notion of a krill surplus has evaporated."[44] In 1992 the Scientific Committee agreed that work on the concept of a krill surplus should be a low priority.[45] Krill harvesting depends on several variables: competition from other fisheries; economic factors; vessel availability; technological developments; and environmental conditions such as seasonal ice cover.[46] In the 1980s most krill harvesting was carried out by Japan, Korea, and the USSR. Chile, Germany, and Poland were also involved.

Table 1

Krill catch figures in tonnes 1989/90 to 1999/00[47]

Year	*Euphausia superba*	Year	*Euphausia superba*
1989/90	374,775	1995/96	101,714
1990/91	357,538	1996/97	82,508
1991/92	302,961	1997/98	80,875
1992/93	88,847	1998/99	103,318
1993/94	83,891	1999/00	101,286
1994/95	118,715	-	-

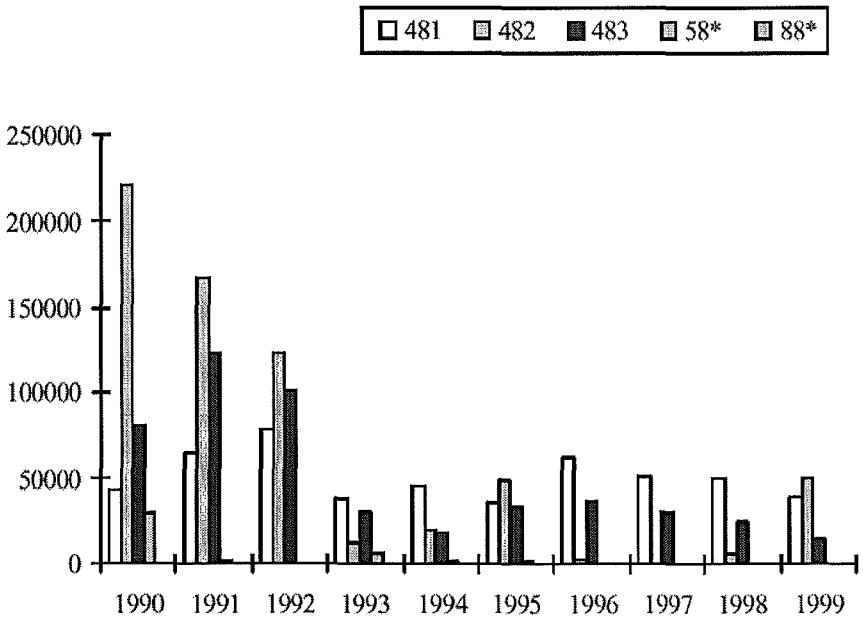
Krill was not dealt with formally through conservation measures by CCAMLR until 1991 when Conservation Measures 32/X and 45/XI were adopted. Stephen Nicol observed the lack of comment in the published reports of the Scientific Committee and the Commission about krill. Nicol found this surprising considering that the CCAMLR convention has been nicknamed the 'krill' Convention: "there is no evidence from the reports that CCAMLR

[41] Takesi Nagata, "The Implementation of the Convention on the Conservation of Antarctic Marine Living Resources: Needs and Problems", in Francisco Orrego Vicuña, *Antarctic Resources Policy: Scientific, Legal, and Political Issues*, Cambridge University Press: Cambridge, 1983, p.125.
[42] Christopher C. Joyner, op. cit., pp.143-144.
[43] SC-CAMLR-III, 9.7, p.30.
[44] Christopher C. Joyner, op. cit., p.144.
[45] SC-CAMLR-XI, 6.9, p.60.
[46] SC-CAMLR-VII, 2.9, p.7.
[47] CCAMLR 2000, *Statistical Bulletin*, Vol. 12 (1989-1999), CCAMLR: Hobart, Australia, p.19, and CCAMLR, *CCAMLR Newsletter*, 22, January 2001.

was striving to tackle this problem as a priority".[48] One reason given for the Commission not focusing on krill was that because some stocks of finfish had declined catastrophically in abundance, and other stocks were in danger of overexploitation, attention was being focused on that problem. Although there was a commercial catch for krill, estimates of the krill stock were around two orders of magnitude greater than the catches from 1982 to 1985, and it was not perceived as a pressing problem at that time. This lack of urgency may explain why it took so long to convene a working group for krill.

Graph 1

Euphausia superba catch in CCAMLR Statistical Subareas 1990-1999[49]



In 1988 the Commission agreed to establish a permanent Working Group on Krill (WG-Krill).[50] The following year the problem of uncertainty was discussed.[51] The issue at that time was whether the krill catch should be restricted to current levels. Some members expressed reservations that this action would be premature at this stage. Other members thought that a general policy of setting TACs in some areas would minimise exploitation. The focus of this discussion was Subarea 48.3, where the krill fishing was at that time

[48] Stephen Nicol, "Management of the Krill Fishery: Was CCAMLR Slow to Act?", *Polar Record*, 28 (165), 1992, p.155.
[49] CCAMLR 2000, *Statistical Bulletin*, Vol. 12 (1989-1999), CCAMLR: Hobart, Australia, p.109.
[50] CCAMLR-VII, 55, p.14.
[51] SC-CAMLR-VIII, 2.29, p.10.

focused, due to the concentrations of krill which can be harvested there.[52] In 1990 WG-krill was unable to estimate krill biomass in 48.3 and therefore unable to estimate potential yield.[53] The following advice was given:

> In the light of the uncertainties outlined above, and in the absence of any reliable estimate of potential yield of krill in Subarea 48.3, the Scientific Committee recommended that the Commission consider imposing precautionary measures for limiting krill fishing in Subarea 48.3.[54]

Japan, USSR and Korea did not think this course of action was justifiable yet.[55] There was still no management advice, and opinions differed as to whether or not regulation should begin.[56] The argument here was on what action was most appropriate when there was a lack of information to base decisions on. Some members felt that catch limits were needed to limit the uncontrolled expansion of a fishery. Catch limits had been used in other organisations, such as the Northwest Atlantic Fisheries Organisation (NAFO).[57] The fishing states opposed this, arguing that the krill fishery had stayed at the same level since 1986. Australia and New Zealand expressed their strong disappointment:

> Krill was by far the largest fishery in the Convention Area and its development had been a key factor prompting the negotiation of the Convention. It was therefore a matter of deep concern that in its nine annual meetings since the Commission commenced operation, it had not been possible to secure the cooperation of the major fishing members for the adoption of any measure directed at the conservation of krill.[58]

The following year the "Commission endorsed the advice of the Scientific Committee that reactive management – the practice of taking management action when the need for it has become apparent – is not a viable long-term strategy for the krill fishery."[59]

Summary

Passing any conservation measures in the 1980s was difficult for CCAMLR due to the requirement for consensus combined with the fact that "anything proposed has to pass the

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[52] SC-CAMLR-VIII, 2.48, p.14.
[53] SC-CAMLR-IX, 2.73-2.74, pp.16-17.
[54] SC-CAMLR-IX, 2.76, p.17. Emphasis in the original.
[55] CCAMLR-IX, 8.3 and 8.7, p.28.
[56] CCAMLR-IX, 4.14-4.16, p.8.
[57] CCAMLR-IX, 8.8, pp.28-29.
[58] CCAMLR-IX, 8.12, p.29.
[59] CCAMLR-X, 6.13, p.16.

closest scrutiny by Members with fishing interests, who tend to have a traditional resistance to the imposition of any restrictions."[60] Fortunately CCAMLR was established before the krill fishery was in a position to affect the sustainable yield. In the long term krill will be of more concern than finfish stocks because krill plays a more central part in the ecosystem of the Southern Ocean. "The Commission will ultimately be judged on its ability to manage its largest and most basic resource – krill – and in this regard it must act promptly."[61] Fishing nations asserted that krill management should be based on scientifically formulated assessments and rejected the use of historical catch levels as a basis for setting current and future limits as unscientific.[62] This reveals how important the role of science was in shaping what conservation measures were possible within the CCAMLR decision-making process. As scientific understanding improved the chances of precautionary measures being implemented increased. However, in the 1980s the conservation provisions made by CCAMLR were not tested by real pressure.

Participation in the CCAMLR Regime

The issue of participation in the CCAMLR regime is an important one. Externally CCAMLR seeks both recognition as the legitimate authority, and compliance with that authority. The issue of participation was important during the negotiations of CCAMLR, the accession of the Economic Community, and the slow acceptance of NGO observers at the meetings.

CCAMLR negotiations and the need for external recognition

Participation was a spur to the development of CCAMLR, when interest from the United Nations Environment Program (UNEP), the FAO, and non-ATS members grew in the Southern Oceans and in a sense threatened the control of the ATCPs over Antarctica.[63] In order for the ATCPs to retain their dominance of Antarctic affairs they had to secure external recognition for their new Convention. The provisions for limited active

[60] J. P. Croxall, I. Everson, and D. G. M. Miller, "Management of the Antarctic Krill Fishery", *Polar Record*, 28 (164), 1992, p.64.
[61] Stephen Nicol, "CCAMLR and its Approaches to Management of the Krill Fishery", *Polar Record*, 27 (162), 1991, p.236.
[62] J. P. Croxall, I. Everson, and D. G. M. Miller, op. cit., p.65.

participation, combined with the secret and closed CCAMLR negotiations, caused some criticism: "the Consultative Parties appeared guilty of assuming a somewhat arrogant attitude when dealing with a subject possessing significant implications for the wider world."[64]

James Barnes thought that the Convention might be unacceptable to some non-ATCPs "primarily because it essentially requires acceding nations to accept the de facto control of the Antarctic Treaty Parties over many decisions concerning the Antarctic continent and surrounding waters."[65] Matthew Howard thought that CCAMLR might strengthen the claim that the ATS members are looking after Antarctica for everyone, but: "Such a claim is sustainable only if the CCAMLR Regime is seen to be working properly and affording the environment adequate protection."[66]

When CCAMLR was negotiated it was unusual for fishery conservation agreements to include as members states that were not interested in exploiting the resource. All of the original participants of the IWC were actually engaged in whaling, even if many of them later came to adopt a conservationist stance. Edwards and Heap observed that "For a state whose interest is restricted to *conservation*, to be a member of such organizations is exceptional."[67] This is no longer the case today and participation by conservation minded states is no longer exceptional in multi-lateral agreements dealing with resources and the environment. The Antarctic sovereignty claims issue meant that there were non-fishing states involved in the negotiations, which made the creation of CCAMLR in the shape it eventually took more probable. This was because the Convention was a way of strengthening the protection that the Antarctic Treaty gave to sovereignty claims. This may also have strengthened the conservationist nature of CCAMLR.[68] While there has been criticism of the advantage gained by the initial CCAMLR members it should be remembered that the fishing states have agreed to restrict their rights to exploiting the resources. As for the conservationist member states: "the Convention requires it to embark on the morally dangerous path of being its brother's keeper – and to pay for the

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[63] Matthew Howard, op. cit., p.111.
[64] P. J. Beck, op. cit., p.229.
[65] James N. Barnes, op. cit., pp.239-240.
[66] Matthew Howard, op. cit., p.105.
[67] David M. Edwards and John A. Heap, op. cit., p.359. Emphasis in the original.
[68] J. A. Heap, "Antarctic Sovereignty: A Source of Stress", in R.A. Hall, H.R. Hall, and M.G. Haward, *Antarctica's Future: Continuity or Change?*, Tasmanian Government Printer: Hobart, 1990, p.185.

privilege."[69] Other states that want to take part may be inclined to join in order to avoid irregularities and friction developing between them and the CCAMLR members.

CCAMLR was generally successful in gaining early external recognition and is considered to be in conformity with UNCLOS as a regional fisheries agreement.[70] The ecosystem approach "is part of the basis for the FAO's recognition of the Consultative Parties' legal authority regarding protection of the Antarctic ecosystem."[71] This forestalled the FAO becoming more significantly involved in the region. This was counted as a success for the ATS regime and its effectiveness. The FAO eighteenth annual conference made an express statement of recognition, and the FAO fisheries committee desisted from pursuing a parallel effort.[72] CCAMLR invited the FAO to attend meetings as an observer, which has happened on an irregular basis.

In 1984 the Commission Chairman stated that "we would hope that countries and bodies which are not yet associated with CCAMLR will recognise the merits of the Convention and the desirability of supporting the regime it will establish. We must continue to encourage participation in our work by all countries which are active or interested in Antarctic marine resources."[73] The CCAMLR members know that the eyes of the world have remained on them since then. In 1985 the Scientific Committee Chairman noted that "the international community was watching the Scientific Committee critically for further positive steps towards conservation in support of the Convention by providing sound advice to the Chairman."[74] For the most part CCAMLR has been successful over the years that followed. In 1992 Ambassador Penny Wensley noted that UNCED was deferring to the ATS in relation to Antarctica and that CCAMLR had anticipated by twelve years the principles of sustainable development.[75] In 1993 the IUCN said it was planning a resolution stressing the importance of CCAMLR.[76]

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[69] David M. Edwards and John A. Heap, op. cit.
[70] P. J. Beck, op. cit., p.233.
[71] Fernando Zegers, op. cit., p.151.
[72] ibid., p.152.
[73] CCAMLR-III, Chairmans Report, Annex C, 7, p.32.
[74] SC-CAMLR-IV, 3.9, p.4.
[75] CCAMLR-XI, 1.9-1.10, p.2.

Funding issues of the CCAMLR regime

During negotiations for the Convention there was a difference of view as to who should bear the weight of paying for the Commission:

> The harvesters argued that if non-harvesters were to be afforded a say in regulating the harvesting activities then they should pay substantially for the privilege. The non-harvesters argued that if the resource was worth harvesting then the harvesters should pay substantially for the privilege.[77]

This difference of view was not resolved in the Convention which stated in Article XIX (3) that for the first five years the contribution required from each member would be equal. After that point the contribution would depend on the amount harvested and an equal share from among all the Commission members. The exact proportion was to be determined by consensus. The Standing Committee on Administration and Finance (SCAF) was established at the second meeting of the Commission.[78] The initial funding agreement was to expire 7 April 1987. In 1986 the Commission began working out the new formula for calculating the contribution required of each member. The harvesting members paid: USSR $A40,000, Japan $A9,000, Poland $A1,000, plus an equal share of the remainder from all members.[79] The funding formula was revised again in 1990, and the maximum possible contribution that a harvesting state could pay was fixed at 25%.[80] In 1995 a consensus was not obtained on a new funding formula, with Japan reiterating its position that any new formula should not require excessive burdens on the contribution made by fishing nations.[81]

In 1997 there was a Management Review of the secretariat. New Zealand noted that some key recommendations, including strategic planning and staff performance assessments had not been implemented.[82] Spain reaffirmed its continued opposition to the issue of

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[76] SC-CAMLR-XII, 12.26, p.74.
[77] Edwards, David M. and John A. Heap, op. cit., p.356.
[78] CCAMLR-II, 12-14, pp.2-4.
[79] CCAMLR-V, 33, p.7.
[80] CCAMLR-IX, 3.9-3.10, pp.4-5.
[81] CCAMLR-XIV, 3.30, p.7.
[82] "It was disappointing ... to find that while many of the recommendations had been accepted and were being put into practice, the impression was created that the Executive Secretary had resiled from central proposals concerning strategic planning and staff management." *Commission for the Convention for the Conservation of Antarctic Marine Living Resources, CCAMLR XVII: Hobart, 26 October – 6 November 1998, Report of the New Zealand Delegation*, Antarctic Policy Unit: Wellington, November 1998, p.15.

performance criteria for the Executive Secretary.[83] Germany made it clear that it normally pursues the objective of a nominal zero growth of budget in all international organisations, but was willing to accept change in the budget due to the importance of the Catch Documentation scheme.[84] The current budget of the Commission is approximately $A 2,000,000.[85]

On the whole the funding issue has not been crucial to the performance of CCAMLR. The budget has been kept at a level that allows the Secretariat to function effectively at its present level of commitments, without the member governments complaining about the cost. At times CCAMLR appears to have operated off a financial surplus produced by contributions from new members, however the number of new members has declined since the 1980s. The contribution requirement may be a deterrent to further expansion of membership, but this requirement was needed for the fishing members to feel comfortable that their IWC experience would not be repeated. There were financial difficulties in 1999 due to the timing of payment of Members' contributions.[86] The contribution formula was carried forward to 2000 and further development was left to intersessional correspondence.[87] An increasing workload potentially leads to increasing costs, it has been recognised however that for maintaining centralised databases, information repositories, and data management that the CCAMLR Secretariat is more efficient than having the services maintained by individual members.[88]

European Community participation in the CCAMLR regime

The European Economic Community (EEC), now the European Union (EU), was treated as a member of the Commission at the first meeting of the Commission, although some questions were raised at the time.[89] Article XXIX of the Convention allows regional economic integration organisations which include among its state members one or more members of the Commission which have transferred competence in the matters covered by

[83] CCAMLR-XVIII, 3.15-3.16, p.5.
[84] CCAMLR-XVIII, 3.21, p.6.
[85] The 1999 budget was for $A 2,002,200, of which translation costs were $A 277,900, CCAMLR-XVII, SCAF Report Appendix II, "Review of the 1998 Budget, Budget for 1999, and Forecast Budget for 2000", pp.8-9.
[86] CCAMLR-XVIII, 3.5-3.12, pp.4-5.
[87] CCAMLR-XVIII, 3.13, p.5.
[88] CCAMLR-XIV, 4.25, pp.12-13.
[89] CCAMLR-I, 8-11, p.2. See also, Chapter 3, p.73.

the Convention. The EEC was involved because of the common fishing policy (CFP) which its members had developed. The EEC participated in CCAMLR because it was seen as an international fishing agreement. At the time CCAMLR was signed the transfer of legal authority with regard to environmental protection to the EEC from its member states was not complete.[90] The mechanics of its participation were left vague.[91] The role played by the EEC in the Commission has become more salient over time.[92]

NGO Observers

The level of access enjoyed by observers at CCAMLR meetings differs from that of members. At the end of each meeting the Commission extends an invitation for attendance to the next meeting. This invitation is not always taken up, for example the IUCN has not attended every meeting. Some observers are invited to improve the quality of the scientific information available to the Scientific Committee and the Commission. While CCAMLR has readily accepted observers from other international organisations from its very first meeting, and has invited states to participate as observers, it took time for some environmental NGOs to gain admittance. Some disappointment was expressed over the rules on observers at the first meeting.[93]

ASOC and Greenpeace first applied to the Commission for observer status in 1983. The Commission was hesitant about including these groups as observers, unsure of their commitment to the Convention.[94] The Commission preferred to work with the umbrella organisation of ASOC rather than individual organisation like Greenpeace. In 1984 the Commission preferred "to entertain further only ASOC's request for observer status on the grounds that it purported to be a representative organization composed of a number of component bodies."[95] The Commission noted that "ASOC was not able to predict the

[90] Josyane Couratier, "Regime for the Conservation of Antarctic Marine Living Resources", in Francisco Orrego Vicuña, *Antarctic Resources Policy: Scientific, Legal, and Political Issues*, Cambridge University Press: Cambridge, 1983, p.148.
[91] James N. Barnes, op. cit., p.256.
[92] See Chapter 5, pp.217-220 for detail about the role of the European Commission in the late 1990s.
[93] CCAMLR-I, 16, p.3.
[94] CCAMLR-II, 43, p.14. "It was agreed that the Executive Secretary write to both organisations requesting information as to their ability to contribute to the objectives of the Commission."
[95] CCAMLR-III, 55, p.13. In 1985 the Commission did not take up on a new request from Greenpeace International for observer status. CCAMLR-IV, 51, p.17. In 1988 Another request was received from Greenpeace International but the Commission was not prepared to grant it observer status at this time. CCAMLR-VII, 160, p.43. Another Greenpeace application was rejected on the grounds Greenpeace was part of ASOC. SC-CAMLR-IX, 9.16-9.17, p.60. Some members accepted that this could change in the future,

contribution it could make to the work of CCAMLR."[96] Questions arose as "the Commission would not wish to conclude an agreement to accord observer status to an organization which was not willing to accord the same degree of support for the principles and objectives of the Convention as is inherent in membership of the Commission or accession to the Convention."[97] While acknowledging that ASOC could be a good channel of communication, ASOC was asked for its unequivocal support for the principles of the Convention.

Without making any commitment the Commission began formulating the conditions that would apply to ASOC if they were granted observer status.[98] The Commission still had reservations about "the adherence of the member organizations of ASOC to the principles and purposes of the Convention ... its durability as an organisation ... [and] how communication between the Commission and the member organisations of ASOC would work in practice."[99] In 1986 the request from ASOC was considered again. While there was widespread support for establishing an agreement with ASOC a consensus could not be reached.[100] The possibility of the question of ASOC attendance at the sixth meeting being decided on an *ad hoc* basis between meetings was agreed.[101] No consensus was forthcoming in 1987 and several delegations expressed their regret and belief that ASOC would be of assistance.[102]

In 1988 ASOC was admitted an observer to that meeting of the Commission, but not the Scientific Committee.[103] One of the conditions was that "ASOC will at all times respect the confidentiality of the discussions at private sessions of the Commission and will not make them public."[104] In 1989 ASOC requested to be allowed to observe the Scientific Committee, and the Scientific Committee referred the matter to the Commission, which then referred the matter back to the Committee.[105] In 1990 Japan would not accept ASOC

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but one delegation pointed out that Greenpeace had acted outside the law. CCAMLR-IX, 15.3-15.9, pp.46-47. In 1998 Greenpeace was at least able to access the margins of the meeting through ASOC, and hosted its own dinner trip around the Hobart harbour for delegates (personal notes).

[96] CCAMLR-III, 56, p.14.
[97] CCAMLR-III, 58, p.14.
[98] CCAMLR-IV, 49, pp.16-17.
[99] CCAMLR-IV, 48, p.16.
[100] CCAMLR-V, 80, p.30.
[101] CCAMLR-V, 81-84, p.30.
[102] CCAMLR-VI, 126-127, pp.32-33.
[103] CCAMLR-VII, 153-156, pp.41-42.
[104] CCAMLR-VII, 153, p.41. See Chapter 5, pp.181-182 for details of problem in this area in 1998.
[105] SC-CAMLR-VIII, 13.14, p.53, and CCAMLR-VIII, 156, p.38.

at the Scientific Committee on the grounds that the rules of procedure were inadequate, that it could undermine the confidentiality of data, and "as ASOC is a 'movement', the Scientific Committee would not benefit from the presence of an ASOC observer at the Committee."[106] In 1991 Japan accepted ASOC as an observer at the plenary meetings of the Scientific Committee and ASOC agreed to the conditions set.[107]

In 1994 there was an extensive review of arrangements for inviting observers to CCAMLR meetings.[108] Rules were amended to differentiate between observers from acceding states and other observers. In 2000 an ASOC observer was allowed access to the Standing Committee on Observation and Inspection (SCOI) meeting. In general the NGOs improve the transparency of CCAMLR and its public accountability as the regime responsible for managing the Southern Ocean. There are limits to how far the transparency process can go, as the decisions that are made behind closed doors can be moved to other venues, perhaps switching from SCOI to the Heads of Delegation meeting.[109]

Membership growth

At the first meeting the following states were members of the Commission: Argentina, Australia, Chile, France, German Democratic Republic, Federal Republic of Germany, Japan, New Zealand, South Africa, United Kingdom, United States, and the USSR. The EEC became a member of the Commission at the first meeting. Norway and Belgium, both original signatories, started attending at the second meeting. Poland became a Commission member by the 1984 meeting. Spain and Sweden acceded in 1984. India and the Republic of Korea acceded in 1985. Brazil, India, and the Republic of Korea joined the Commission as members, and Uruguay acceded in 1986. Spain became a Commission member in 1987. Canada acceded in 1988. Finland, Italy, and Peru acceded in 1989. Sweden and Italy became Commission members in 1990, the Netherlands acceded and GDR and FRG became Germany. In 1992 Ukraine left the USSR and became an acceding member, while the Russian Federation replaced the USSR as Commission member. Bulgaria was present

[106] SC-CAMLR-IX, 9.10 p.59, and 9.15, p.60.
[107] SC-CAMLR-X, 1.9-1.11, pp.2-3.
[108] CCAMLR-XIII, 13.1-13.14, pp.57-60.
[109] Interview with Alan Hemmings, 22 November, 2000.

as an acceding state in 1992.[110] In 1996 Uruguay became a member. Ukraine became a member of the Commission before the XIV Meeting.[111] Some ATCPs are not Members of CCAMLR, notably China and Ecuador. More commonly many NCPs are not Members of CCAMLR, such as Switzerland, Colombia, and Turkey. In the late 1990s the Commission began to actively invite third-party states to join in reaction to their involvement in IUU fishing, the first result being the accession of Namibia in 2000.[112]

Third-party activity

The lack of jurisdiction that CCAMLR has over the high seas has meant that the presence of third-party, or non-member states, always had the potential to create problems for the enforcement of CCAMLR conservation measures as the Convention is not legally enforceable on third-parties. Article XXII of the Convention allows for inconsistent activities to be discouraged but such efforts have to be within the United Nations Charter. Article XII requires members to notify the Commission of any activity contrary to the objectives of the Convention. Article X requires the Commission to inform the appropriate state of these activities. "By providing that activities which are contrary to that objective must, when they become known, be brought out into the open it goes far towards ensuring that pressure, if only of international public opinion, can be brought to bear on the miscreants."[113] This watch-dog role gives the Commission some authority when it comes to enforcing the obligations of the Convention.

As late as 1994 Karl-Hermann Kock was able to write that "No threat to the conservation of Antarctic marine living resources is currently posed by fishing operations of non-Contracting parties or vessels reflagged to flags of convenience".[114] By 1997 the problem of flags of convenience was all too real.[115] Third-party states are less of a problem if the CCAMLR members, and the rest of the ATCPs, are united over the issue of IUU fishing. In this case the actions of CCAMLR member nationals are of great concern as they reduce the moral authority of the ATS.

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[110] CCAMLR-XVII, 11.3, p.81. Bulgaria has fulfilled the requirements, but has not chosen to become a member of the Commission.
[111] CCAMLR-XIV, 1.5, p.1.
[112] In 2001 Vanuatu acceded to the Convention, and Namibia became a member of the Commission.
[113] David M. Edwards and John A. Heap, op. cit., p.358.
[114] Karl-Hermann Kock, op. cit., p.15.
[115] See Chapter 5, pp.189-190.

The issue of participation is one that is affected by the 'Common Heritage of Mankind' arguments against the exclusive nature of the ATS 'club' of member states. These complaints were not targeted against CCAMLR in particular, but more the ATS as a whole. Although CCAMLR is responsible for resource exploitation, the marine fisheries of the Southern Ocean have attracted less attention than the hydrocarbon potential did when CRAMRA was being negotiated. His Excellency General Sir Phillip Bennet, Governor of Tasmania, in his opening address in 1990, commented on how CCAMLR was the only ATS component with resource responsibility. "Its success, therefore, in this area was of fundamental importance in convincing the world that the Treaty System was the only appropriate vehicle at present through which the region can be administered."[116]

The current problem is one of dealing with third-party IUU fishing and gaining assistance from non-members, such as Namibia and Mauritius, to deal with that problem. Some ATPs are not members of CCAMLR. This has the potential to generate friction within the ATS if IUU harvested fish are transported through markets in ATPs that are not members of CCAMLR. External pressure on the ATS may also resurge if CCAMLR continues to ineffectively resolve the IUU and incidental mortality issues, but so far the consensus within the UN is holding.

The Consensus System and the Decision-Making Procedures of CCAMLR

The key principle on which the decision-making procedures of CCAMLR are based is the consensus system. The consensus system was required as a political safeguard due to the sovereignty claims issue in Antarctica. A key point here is that the "claimants were actually or potentially renouncing to the implementation of the Exclusive Economic Zone in Antarctica in order to join a scheme of joint jurisdiction to be managed through CCAMLR institutions."[117] Other alternatives for decision-making were discussed, but unanimity could not be reached on the objections of some ATCPs. According to Barnes, Japan and the USSR accepted the move away from the MSY concept in part because they could control how the ecosystem standard was going to be implemented in the new

[116] CCAMLR-IX, 1.7, p.1
[117] Francisco Orrego Vicuña, "The Effectiveness of the Decision-Making Machinery of CCAMLR: An Assessment", in Arnfinn Jørgensen-Dahl and Willy Østreng, *The Antarctic Treaty System In World Politics*, Fridtjof Nansen Institute: London, 1991, p.27.

regime.[118] The consensus rule accommodated the positions of the claimants and "it was also a procedure which coincided with the interests of fishing nations wishing to retain much of the discretion that they had enjoyed in the absence of the regime."[119] While a majority rule based system might have been more effective in adopting conservation measures, it was not a system that was acceptable to the fishing nations, and would be potentially weaker in implementation than the consensus system.

What consensus decision-making means

There was confusion at the first meeting of the Commission about what consensus actually meant.[120] The Convention calls for consensus on substantive matters, not procedural ones. Consensus, unanimity, and veto have sometimes been used as interchangeable terms when discussing CCAMLR and its decision-making process. The Convention provides for consensus, not veto power as some have considered it. This derives from practice at the United Nations and during the UNCLOS negotiations. It involves an obligation of all parties to attempt to arrive at an agreement by all possible means, acting in good faith, seeking a compromise, and making every effort necessary to achieve that goal: "it entails a positive obligation, whereas veto power is only a negative right or power to oppose a settlement without stating one's reasons."[121] If all negotiations to reach agreement have failed then the dissenting parties have to draw up a formal objection that states the grounds for that objection. Normally more than one state must be in opposition, when this does not occur the mechanism of entering reservations is applied, and the state will make an explicit reservation at the Commission as to how it will not be bound by the measure.

Withholding consensus over a trivial matter would not be a lightly undertaken action. According to Felicity Wong: "New Zealand would have difficulty in practice vetoing a conservation measure for South Georgia. If we tried to, the other negotiators would tell us to go away and have a cup of tea."[122] More serious consideration might be given to New Zealand if it was determined to block a conservation measure that applied to the Ross Sea.

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[118] James N. Barnes, op. cit., p.262.
[119] W. M. Bush, "The Antarctic Treaty System: A Framework for Evolution, The Concept of a system" in R.A. Hall, H.R. Hall, and M.G. Haward, *Antarctica's Future: Continuity or Change?,* Tasmanian Government Printer: Hobart, 1990, p.142.
[120] Fernando Zegers, op. cit., p.155.
[121] ibid. See comment by Denzil Millar at Chapter 4, p.134.
[122] Felicity Wong, Graduate Certificate in Antarctic Studies (GCAS) Lecture, 13 January 2000.

While a harvesting state can withhold consensus in order to veto a conservation measure, or could prevent the conservation measure from applying to itself, there is a weak form of accountability provided by the fact that these actions will eventually become publicly known. The threat of a veto is likely to be more useful in the preliminary negotiations than its actual use at a late stage of the deliberations.

Concern over sovereignty has diminished slightly over time, allowing the consensus system to take on a more technical role.[123] Consensus does not seem to have been a great problem in developing conservation measures for krill. Once discussion of management for krill started at the eighth meeting of the CCAMLR Commission in 1989 it was only three years before management action was taken.[124] However the 'absence of information' argument still had a lot of influence at CCAMLR meetings.[125] Sovereignty is still a major source of concern, especially with respect to the difficulties encountered over the assumption of coastal state jurisdiction by the UK.[126]

How consensus decision-making works in practice

A special process has evolved for Commission meetings, which usually last for two weeks. This is usually the only time that all the Members are together to discuss the issues. Although membership in the Antarctic Treaty overlaps, it does not exactly match and the ATCM prefers to avoid discussion of CCAMLR business where possible. In 1997 the IUU fishing in the Southern Ocean was widely reported in the media during the XXI ATCM in Christchurch, but discussion of the IUU problem was restricted to the margins of the meeting. Meetings can also occur between interested Members at other times. The Commission has made use of *ad hoc* intersessional working groups when a difficult issue is not resolved at a CCAMLR meeting and the need for speed is felt. In general the bulk of the CCAMLR decision-making takes place at the annual Commission meetings, even if preliminary work takes place in other venues.

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[123] Francisco Orrego Vicuña, op. cit., p.29.
[124] Stephen Nicol, "Management of the Krill Fishery: Was CCAMLR Slow to Act?", *Polar Record*, 28 (165), 1992, p.156.
[125] Stephen Nicol, "CCAMLR and its Approaches to Management of the Krill Fishery", *Polar Record*, 27 (162), 1991, p.235.
[126] See Chapter 5, note 376, p.221 for an example of this.

The Commission initially convenes in a plenary session to open the meeting, then goes into recess. During the recess SCAF, SCOI, and the Scientific Committee convene separately to discuss, debate, and finalise reports to be presented to the Commission. The Heads of Delegations generally attend the SCOI meeting, an indication of its level of importance. As is the case with such international meetings much significant discussion takes place in the 'margins' of the meetings. In the second week the Commission reconvenes in plenary session to consider reports from the committees. The plenary session is also an opportunity for some delegations to make significant statements about the problems facing the Commission – in the late 1990s these statements largely concerned IUU fishing and sovereignty issues. The reports are discussed, proposed measures are considered, and the Commission takes action.

Conservation measures are usually adopted in the following manner. First, the need for a measure is identified, often from a national background paper, an NGO, or the work of the Scientific Committee. Inspiration for new conservation measures usually originates in one or several delegations, which draft measures they think merit approval. In the situations where more than one delegation circulates a similar measure the best ideas from each are usually combined into one measure. Conversely, unpractical ideas are eliminated, or directed to intersessional work. The sponsoring delegation drafts a formal proposal and circulates it informally to other delegations to solicit unofficial reactions. This process allows a sponsoring delegation to get a sense of whether their measure might be approved or be abandoned. Timing is an important consideration in getting a measure to be the main draft text under discussion.

If an unofficial measure is responded to well by the other delegations, then the measure goes to the Commission plenary for discussion. Comments are made on the proposal and the language may be redrafted. Anything official requires translation into the four official languages of CCAMLR: English, Spanish, French, and Russian. This takes time to carry out, and the late arrival of reports required from the delegations can hamper the work of the Scientific Committee or the Commission.[127] Delegations have been known to insist on waiting for a translation in their language before allowing discussion or decision-making

[127] Comments were made about this problem at the Fourth Meeting, SC-CAMLR-IV, 3.6, p.3, and at 8.17, p.43.

on a measure to proceed any further.[128] Even the punctuation of a measure may be subject to negotiation and amendment. Once a measure reaches the Commission it has usually secured informal approval from all delegations and achieved the consensus necessary for adoption.

If objections are voiced against a measure then it may be implemented as a resolution,[129] left for further consideration until the next meeting, or established as an objective for active consideration through intersessional work and meetings. The Scientific Committee utilises many *ad hoc* or Standing Working Groups that meet on a regular intersessional basis. All members are able to nominate experts to such groups, because the members interested in fishing did not want to be vulnerable to an adverse report from a working group.[130] Working groups are a factor in the effectiveness of the Scientific Committee and the Chairs of these groups can be quite influential. Some *ad hoc* groups become established as standing working groups if it becomes apparent that their work is ongoing, others are disestablished when their work is completed.

Summary

The consensus system made CCAMLR possible; without it there would be no CCAMLR and no conservation measures covering the bulk of the Southern Ocean ecosystem.[131] It is difficult to measure the performance of the CCAMLR regime by counting the number of conservation measures that have been adopted, despite the difficulties of the consensus decision-making procedure. While only a small number of conservation measures were adopted in the first ten years of CCAMLR, compared with the larger number of conservation measures adopted since 1991, it is difficult to determine exactly how many measures have been stillborn before reaching the Commission. The consensus system has worked reasonably well for the ATS to date, but CCAMLR has had the additional stumbling block of resource exploitation and commercial interest, something the Antarctic Treaty is now facing with the growth of Antarctic tourism. The increase in the number of conservation measures is partially due to the external pressure caused by IUU fishing, and

[128] SC-CAMLR-IV, 17.2-17.4, pp.53-54. In 1985 problems were encountered with translating technical documents into Spanish.
[129] SC-CAMLR-XVIII/BG/26, "Non-binding but agreed principles are often embodied in resolutions.", p.6.
[130] Matthew Howard, op. cit., p.120.
[131] Francisco Orrego Vicuña, op. cit., p.27.

the internal resolution of institutional organisation problems, rather than any change in how the consensus system is interpreted by the Parties.

The Role of Scientific Advice: The Relationship Between the Commission and the Scientific Committee

The Commission and the Scientific Committee were the first permanent bodies established by the ATS regime (SCAR having preceded the Antarctic Treaty), and the development of the relationship between the two bodies of the Convention was a long and involved one. Problems were encountered in establishing this relationship in the early meetings, with ongoing difficulties in data submissions, and finding a way of incorporating scientific advice into the decision-making of the Commission. The basic test of the relationship between the Commission and Scientific Committee as formulated by James Barnes was:

> (1) whether it facilitates the best possible advice in terms of scope, relevance, precision, timeliness and impartiality, (2) whether it makes use of all sources of data and scientific expertise, and (3) whether it provides for good communication between the management body, the scientific advisers, and the public.[132]

Early assessment of the relationship

Barnes was pessimistic in his assessment of CCAMLR at the time it was negotiated for a variety of reasons. The Scientific Committee lacked the appropriate power for sound decision-making about harvesting levels, there was no agreement on how recommendations would be adopted, the Committee lacked the power to undertake its own research, and the Commission could control the budget through consensus. Research is based on national research programs, not the CCAMLR secretariat. "No delegation was willing to expend political capital to assure that the Scientific Committee had the power, staff, funding, and independence that arguably would be required to furnish advice grounded in fact and risk assessment, instead of economics and politics."[133] Barnes believed that the Convention was adequate on opening data to the public and giving publicity to the Scientific Committee's recommendations.[134]

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[132] James N. Barnes, op. cit., p.266.
[133] ibid.
[134] ibid., p.267.

A different set of views were presented by Edwards and Heap. They argued that the degree of independence between the Commission and the Scientific Committee was not such that the Commission can disregard the advice of the Committee. The Commission has to take "full account" of advice and recommendations and to publish the advice given and conservation measures adopted. The Scientific Committee does have some degree of independence from the Commission. Article XIII (6) allows the Commission to establish subsidiary bodies – which is useful if the Scientific Committee is to deal with technical problems.[135]

Takesi Nagata identified five major problems that CCAMLR, and the Scientific Committee, had to solve in order to implement the Convention. These were:

(1) Inventory of activities and information.
(2) Review of the state of the ecosystem and modelling of Antarctic ecosystem.
(3) Identification of research needs and gaps in present knowledge.
(4) Management goals.
(5) CCAMLR data base.[136]

Successfully implementing effective management goals requires the resolution of the other problems. CCAMLR made use of information developed by programs that were under way before CCAMLR, such as the BIOMASS research program, which was implemented by SCAR. A great deal of work remained to be done, and some crucial elements were yet to be completed twenty years later. There were no easy answers due to the harsh conditions in the Southern Ocean region and the limitations of scientific methods.

Reports – problems of the early meetings

At the early CCAMLR meetings there was a deadlock about the role of the Scientific Committee. "The manner in which these institutional arrangements worked out in practice during the early period of the implementation of CCAMLR was disastrous."[137] Some Commission members viewed the Scientific Committee as a political body, an interpretation which would mean that there was no independent scientific advice and that the entire regime would respond to national interests.[138] One issue at the first meeting was

[135] David M. Edwards and John A. Heap, op. cit., p.357.
[136] Takesi Nagata, op. cit., p.119.
[137] Francisco Orrego Vicuña, op. cit., p.30.
[138] Matthew Howard, op. cit., p.117.

the difficulty experienced in the election of the chair and vice-chair of the meeting. The other issue regarded the decision-making of the Scientific Committee.[139] Rule 17 of the Temporary Rules of Procedure was replaced with "Decisions should be taken according to the Convention."[140] Because of these diversions the amount of discussion on the program of work was limited to calling for an inventory of existing data and programs, and an inventory of existing logbooks and proposals for a common format.[141]

CCAMLR Article XVI refers to "minority reports" which implies the adoption of "majority reports" without the use of the consensus decision-making procedure. The USSR insisted on a consensus based decision-making procedure, and this was finally accepted as a requirement for the adoption of reports in the Scientific Committee. Howard explained the motivation for this: "Member States which supported consensus voting for the Scientific Committee seem to have been fearful that they would be left vulnerable if they did not have an effective veto."[142] However, this does not prevent non-consensus scientific views from being aired as all the views expressed at the Scientific Committee are included in the final report.[143]

No unanimous agreement was reached on the rules of procedure in intersessional work between the first and second meetings of the Commission. They were subsequently adopted at the second meeting after Rule 17 was amended and the following was added to Rule 21 "The Commission shall take full account of the Reports of the Scientific Committee."[144] At the second meeting of the Scientific Committee the "urgent need to provide timely scientific advice to the Commission was emphasised by many members."[145] The main areas of discussion were: information and data, research requirements, management goals, and other matters.[146] The formation of *ad hoc* intersessional working

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[139] ibid., pp.117-122.
[140] SC-CAMLR-I, 5-6, p.1.
[141] SC-CAMLR-I, Annex 2, Appendix 1-2.
[142] Matthew Howard, op. cit., p.119.
[143] Rule 3 of the Rules of Procedure of the Scientific Committee: "Scientific recommendations and advice to be provided by the Scientific Committee pursuant to the Convention shall normally be determined by consensus. Where consensus cannot be achieved the Committee shall set out in its report all views advanced on the matter under consideration. Reports of the Scientific Committee to the Commission shall reflect all the views expressed at the Committee on the matters discussed. If a Member or group of Members in the Committee so wishes, additional views of that Member or group of Members on any particular questions may be submitted directly to the Commission."
[144] CCAMLR-II, 10, p.2.
[145] SC-CAMLR-II, 44, p.9.
[146] SC-CAMLR-II, 12, p.2.

groups was considered. One decision reached here was that "all members could nominate experts to attend the meeting"[147] of any working group – the members interested in fishing were again making sure they had input at all stages of discussion. Working groups were considered for: fish stocks, krill, dependent and related species, data collection, and ecosystem management. No krill working group was considered necessary at that time due to the existing BIOMASS program.[148] There was a general sense of caution towards establishing permanent subsidiary bodies in case they duplicated work already being done by the Scientific Committee, or the CCAMLR Secretariat.[149]

The institutional relationship between the Scientific Committee and the Commission did change and this had a direct connection to changing attitudes about conservation measures.[150] This was in part due to a change in the use of consensus. In the Scientific Committee consensus began to be used as a technical device to harmonise views on the scientific conclusions. "This is a context in which consensus operates very differently from the paralysing effects that a simple veto could have had."[151] The relationship between the Commission and the Scientific Committee was slowly built up. In 1987 the Scientific Committee requested guidance from the Commission about management policy: "The Committee has difficulty in providing advice in the absence of clear decisions over the policy the Commission wishes to pursue".[152] A range of possible measures were outlined: general policies; specific policies; strategies and tactics.[153] The Commission response was to begin taking on the decision-making role in "recognition that the Scientific Committee could not come up with a single, absolute scientific truth adopted by consensus but only with reasonably justified scientific alternatives."[154] However, much work remained to be done on the relationship, and there was no great development in, or proliferation of, the conservation measures adopted by the Commission.

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[147] SC-CAMLR-II, 46, p.10.
[148] SC-CAMLR-II, 56, p.12.
[149] SC-CAMLR-II, 88-89, p.19.
[150] Francisco Orrego Vicuña, op. cit., pp.32-33.
[151] ibid, p.32.
[152] SC-CAMLR-VI, 5.80, p.38.
[153] SC-CAMLR-VI, 5.35, pp.23-24.

Data submission problems

Article XX of the Convention obligates CCAMLR members to supply information to the Commission and Scientific Committee. The use of commercial data is an important consideration in this. Commercial data is kept in confidence when used in the various working groups of the Scientific Committee, even though the results derived from that data will be made public. Commercial data is often more readily available than scientific data as it is: "collected incidentally to an activity which is paying for itself."[155] The problem is that with: "commercial data the CCAMLR Regime receives what the fishing members are *prepared* to supply."[156] Any imbalance can be avoided by concentrating scientific research on those areas that will not be covered by commercial operations. Research is not a direct function of the Scientific Committee unless directed to by the Commission.[157] The Commission has carried out its own research programs in the past, such as the krill synoptic survey conducted January-February 2000.

Previous fishing statistics were gathered by the Scientific Committee, but not without some difficulty, as the information was often incomplete or in a non-standard form, such as being recorded in calendar years rather than the split seasons appropriate for the Southern Ocean summer fishing season.[158] Howard noted that "the fishing nations have resisted vigorously the imposition upon them of information collection responsibilities."[159] The fishing members preferred to submit a summary of their data, rather than the entirety of the raw data. In 1986 there were still gaps in the recent and historical records, with catches being reported as unidentified. One suggestion was that the inclusion of scientific observers on commercial vessels would help ensure correct identification.[160]

One debate in the Scientific Committee in the mid-1980s was over the need for 'fine-scale data'. Japan said that fine data was not necessary for the moment, while the USSR thought that processing the volume of data involved would be a burden for the Secretariat.[161] The

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[154] Francisco Orrego Vicuña, op. cit., p.33.
[155] Matthew Howard, op. cit., p.124.
[156] ibid., p.130. Emphasis in the original.
[157] Appendix II, Article XV (2) (e)-(f).
[158] Matthew Howard, op. cit., pp.124-125.
[159] ibid., p.126.
[160] SC-CAMLR-V, 7.2 and 7.5, p.35.
[161] SC-CAMLR-III, 6.30, p.11.

scale was then agreed at 0.5° latitude by 1.0° longitude over ten days.[162] There were still problems in the supply of fine scale data in 1985, and the need for future data to be in fine scale was re-emphasised as it was difficult to determine conservation measure effectiveness without it.[163] The response from Japan was that "if there were deficiencies in the supply of data, the proper course would be to postpone decisions to encourage data submission."[164] Based on the experience in Subarea 48.3 there were few difficulties in collecting fine date, and it should be collected in all statistical subareas.[165] Japan informed the Scientific Committee that domestic legislation meant that it could not submit such haul-by-haul data.[166] Other members were concerned that data submission requirements were being avoided because of domestic legal requirements. Some members stated that the obligations of Parties to the Convention took precedence over domestic law.[167] Despite these data submission problems WG-krill continued to make significant progress. The Scientific Committee agreed that the principles of management under uncertainty were being incorporated into the management approach for krill.[168] One problem revealed by the early data was that the krill fishery harvests krill in the same areas every year.

A constant problem with data submissions is their late arrival for use by the working groups of the Scientific Committee.[169] In 1986 only five of the member reports were submitted on time, eleven were late, and two were yet to arrive at the start of the meeting.[170] In 1987 ten reports were received on time, with a further seven being received before the start of the meeting.[171] Only papers received by the Secretariat before the start of the meeting would be considered.[172] Delegates were reminded that the deadline is when data should be received by, not when it needs to be mailed by. In 1988 the "Committee encouraged the Secretariat to enforce the deadlines for submission of documents for future meetings."[173] This was still a problem in 1989.[174] This is something which has become technically easier with the advent of improved access to electronic communication.

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[162] SC-CAMLR-III, 6.29, p.11.
[163] SC-CCAMLR-IV, 4.3, 4.6, and 4.9, pp.4-6.
[164] SC-CAMLR-IV, 4.44, pp.15-16.
[165] SC-CAMLR-XI, 2.26, p.8.
[166] SC-CAMLR-XI, 2.85, p.17.
[167] CCAMLR-XI, 4.13, p.9.
[168] SC-CAMLR-XII, 3.97, p.36.
[169] SC-CAMLR-VI, 9.8, p.59.
[170] SC-CAMLR-V, 3.10, p.4.
[171] SC-CAMLR-VI, 3.7, p.4.
[172] SC-CAMLR-VI, 1.7, p.2.
[173] SC-CAMLR-VII, 12.3, p.47.
[174] SC-CAMLR-VIII, 1.14, p.3.

In 1987 the Chairman of the Scientific Committee noted that the workload of the Scientific Committee was continually increasing, and that close cooperation was required between members for efficient meetings.[175] In 1989 it was noted that the lack of a secretariat for the Antarctic Treaty made communication with the ATCM more difficult, and the need for more formal links was noted.[176] In 1987 the review of the long term program of work noted the apparent lack of effort to integrate national programs into the future framework of Scientific Committee activity.[177]

Decision-making problems

In 1989 a review of data submission found that problems were still occurring with data submission, and that this was dividing the Scientific Committee as to what advice should be given to the Commission even though most members supported some form of protective measures.[178] This review was followed up in 1990 with a WG-FSA report on the topic of living with uncertainty and improving management advice for CCAMLR fish stocks.[179] The lack of information that should have been provided in accordance with Article XX of the Convention had led to the adoption of Conservation Measures that were not sufficient to ensure stock recovery. "This has led to a lowering of the credibility of CCAMLR in the eyes of the public and a strong polarization of opinions inside CCAMLR."[180] The requirements to submit data were not being fully complied with, and there were serious questions about the quality of the some of the data submitted.[181] Many delegations were concerned about this, especially for finfish. "One delegation pointed out that in implementing the Convention, the Commission had not achieved results commensurate with the level of effort and resources that had been applied both directly through CCAMLR activities and in national research programs in support of CCAMLR."[182]

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[175] SC-CAMLR-VI, 3.9, p.4.
[176] CCAMLR-VIII, 146, p.36.
[177] SC-CAMLR-VI, 11.5, p.63.
[178] CCAMLR-VIII, 118-120, p.29.
[179] SC-CAMLR-IX, Annex V, Appendix D, pp.232-243.
[180] SC-CAMLR-IX, Annex V, Appendix D, 3, p.232.
[181] CCAMLR-IX, 4.3, and 4.7-4.8, p.7. The USSR admitted problems, which it hoped to overcome. The need for more scientific observers was noted. SC-CAMLR-X, 4.33, pp.28-29. South Georgia, in 1990 USSR estimates of biomass 878-887,000 tonnes. Should have been more than one million tonnes there in 1991. Professor Beddington was sceptical "Such results were not credible in the light of a minute commercial catch, and a complete absence of commercial concentrations of fish."
[182] CCAMLR-IX, 4.5, p.7.

The standard of certainty in the data being required by the fishing members before advice could be given to the Commission, was such as to indefinitely delay or block the implementation of effective conservation measures in the Convention Area. As the fishing nations were in a position to withhold the data required for certainty, advice was unlikely to be given if this data standard was maintained. "While increased scientific effort can reduce the uncertainty to some extent, particularly over a long time-scale, all the uncertainty cannot be eliminated, and in most practical considerations it is likely to remain considerable."[183] Unless this impasse could be resolved CCAMLR was not going to develop into an effective regime. Denzil Millar made the point in relation to disagreements over ecosystem monitoring "that it is inadequate to offer reservations alone. What must also be provided is alternative, and presumably better, assumptions or indications of the extent to which the original assumptions may be in error."[184]

CCAMLR-IX was the crucial meeting where this data issue was resolved. The conservation minded states brought pressure to bear on the fishing states by arguing how the lack of data should be dealt with and how the lack of advice from the Scientific Committee should be responded to. Several members believed that the lack of data causing uncertainty in scientific advice left no alternative but to act conservatively in adopting Conservation Measures.[185]

> It was noted that the Commission is still obliged to make management decisions when the Scientific Committee has insufficient information to formulate advice. The Commission endorsed the principle that the absence of essential data should be taken into account when determining catch limits: in the absence of data, very conservative catch limits should be set.[186]

The decision-making at the Commission also attracted comment from the Scientific Committee because it appeared that the Commission was prepared to bypass the Scientific Committee entirely when making decisions about the management of the Southern Ocean:

> Dr Everson informed the Commission of deep concern expressed by members of the Scientific Committee regarding decisions taken by the Commission at the last meeting based on anecdotal evidence which was contrary to the advice provided by the Scientific Committee.[187]

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[183] SC-CAMLR-IX, Annex V, Appendix D, 18, p.236.
[184] SC-CAMLR-VIII, 7.9, p.43.
[185] CCAMLR-IX, 4.6, p.7.
[186] CCAMLR-IX, 7.7, pp.26-27.
[187] CCAMLR-IX, 4.2, p.6.

An exceptional personal statement was made by the WG-FAS convener Dr Karl-Hermann Kock:

> 3. In previous years and in particular this year, however, we were increasingly faced with the situation that our advice was discredited or even ignored during informal discussions among Members of the Commission by simply stating that there was not enough scientific evidence for a particular advice without, however, qualifying other scientific information nor indicating what level of certainty is necessary for a particular advice to support this opinion.
>
> 4. As convenor of the [WG-FSA], I would like to express my deep concern about that development taking place. I further think that I should protect my colleagues in the Working Group against what I feel are unsubstantiated statements. I would be glad to see these statements discussed in the Working Group or the Scientific Committee. I cannot accept, however, the present dislocation of the discussion into the Commission and I would like to draw the attention of the Commission to that. It puts not only unnecessary constraints on our work but has considerable implication for the credibility of the whole CCAMLR system.[188]

The problem with scientific advice not always being unequivocal was resolved when: "The Commission endorsed the view that it should regard the Scientific Committee as the source of the best scientific evidence available."[189] The following year the Commission found that the: "Lack of data and the consequent uncertainty in the scientific advice leaves the Commission with no alternative but to act conservatively in adopting conservation measures."[190] The UK opinion was that the fisheries should be closed until the data appears. At the Commission the fishing nations supported precautionary catch limits in principle but opposed them in practice due to lack of scientific justification. Nicol observed that "this latter day commitment to precautionary limits by the fishing nations seems a trifle duplicitous."[191]

Summary of the Commission – Scientific Committee relationship

In 1983 Darry Powell referred to the two channels of advice, science and economics, and observed that the: "ecosystem and the fishing industry will to some extent be in

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[188] CCAMLR-VIII, Annex F, Personal Statement by the Convenor of the Working Group on Fish Stock Assessment, p.99.
[189] CCAMLR-IX, 7.6, p.26. and also "given the wide range of uncertainty highlighted, it must be concluded that advice given by the WG-FSA can rarely be considered unequivocal and should be accepted as 'the best scientific evidence available."
[190] CCAMLR-X, 4.15, p.9.
[191] Stephen Nicol, op. cit., p.234.

competition."[192] There is no formal and explicit process in the Convention for the provision of economic advice, but delegations often include 'advisers'. For example, the New Zealand delegation in the late 1990s usually included two observers, one from an environmental group, the other from a fishing company. Scientific advice itself can not be relied on too strongly.[193] Scientific consensus often takes time to achieve, and this consensus in itself does not prevent over-exploitation and the destruction of living resources. Advice can evolve over time as scientific standards change, such as the abandonment of the MSY harvesting strategy for new harvesting strategies.[194] "If the rate of development of the fishery is slow, then the urgency of gathering information and taking decisions will not be so great. If the rate increases, there will be a pressing need for information."[195] Without accurate information and models CCAMLR is placed in a reactive management system. Reports of the Commission, the Scientific Committee, and the various working groups, all had a common theme about the need for more research: "the provision of scientific advice and, in particular, firm recommendations, have been limited by the state of knowledge of Antarctic marine living resources."[196]

Karl-Hermann Kock, in 1994, wrote that while it was "undeniable that scientific advice has carried much more weight in recent years ... what is not known is *how much* it has influenced the behaviour of the fishing nations."[197] At the same time as an increase in the strength of scientific arguments there were dramatic changes in the Eastern Bloc, a substantial decline in catches of target species, and new economic constraints such as the removal of government subsidies that reduced some fishing efforts. With the benefit of hindsight, and in light of the rise of IUU fishing in the 1990s, it can be seen that while the scientific argument is stronger, the economic argument is still the stronger one. In 1994 Elliott argued that the "Convention is a flawed conservation agreement. The Convention *permits* fishing activity unless it can be shown on the basis of scientific data that it should be controlled."[198] Environmental NGOs have argued that this should be reversed, but

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[192] D.L. Powell, "Scientific and Economic Considerations Relating to the Conservation of Marine Living Resources in Antarctica", in Francisco Orrego Vicuña, *Antarctic Resources Policy: Scientific, Legal, and Political Issues*, Cambridge University Press: Cambridge, 1983, p.117.
[193] ibid., p.116. "Definite scientific advice will be rare, and the simulation of natural systems in mathematics is never exact."
[194] Karl-Hermann Kock, op. cit. p.12.
[195] D.L. Powell, op. cit., p.114.
[196] Darry Powell, "Antarctic Marine Living Resources and CCAMLR", in R.A. Hall, H.R. Hall, and M.G. Haward, *Antarctica's Future: Continuity or Change?*, Tasmanian Government Printer: Hobart, 1990, p.69.
[197] Karl-Hermann Kock, op. cit. Emphasis in the original.
[198] Lorraine Elliott, op. cit., p.97. Emphasis in the original.

despite some progress the burden of proof still lies with those seeking to implement conservation measures, and the Commission members continue to reserve the right to ignore the Scientific Committee's advice. [199]

The Development of the CCAMLR Approach to Ecosystem Management

There are two vital concepts to CCAMLR ecosystem management: the precautionary principle; and the ecosystem approach. A precautionary approach is where decisions should be taken that have a low risk of long-term adverse affects. This is important when working with uncertainty of information. An ecosystem approach attempts to minimise the risk of fisheries adversely affecting dependent and related species. Due to the difficulty of regulating a large and complex marine environment, the CCAMLR ecosystem approach is to regulate human activities, such as fishing, so that deleterious changes in the ecosystems are avoided.[200]

The ecosystem objective was an ambitious one.[201] Implementation of the ecosystem standard was always going to require a commitment to support scientific research politically and financially, while exercising restraint over harvesting.[202] This has not always happened, and some criticism of CCAMLR has been severe in this respect.[203] CCAMLR members have not always been eager to part with the data gathered by their fishing fleets. Inaccurate or incomplete information affects the quality of advice that can be given by the Scientific Committee. A difficulty with this objective is that there is no

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[199] CCAMLR-XV, 8.26, p.37. In 1996 New Zealand observed that it "would continue to place the greatest importance on the advice of the Scientific Committee, but there would be occasions when the Commission wished to signal a message that would require a considered and careful look at what the Scientific Committee had proposed. This was in the context of a wholehearted, collective commitment to finding fair, responsible, timely and innovative answers to difficult and evolving situations." At the time New Zealand was accepting a reduction in the figure proposed by the Scientific Committee for a fishery TAC in Subarea 88.1/88.2 from the Commission.

[200] Karl-Hermann Kock (ed), *Understanding CCAMLR's Approach to Management*, May 2000, http://www.ccamlr.org/English/e_pubs/e_app_to_manag/TEXT_final_.pdf, (site visited March 19, 2001), p.9.

[201] Appendix II, Article II encapsulates the ecosystem approach.

[202] James N. Barnes, op. cit., p.263.

[203] Mahinda Harischandra Parera, op. cit., p.217. "The emphasis placed on the ecosystem principle was largely a means to enhance the international image or prestige of ATCPs."

unambiguous interpretation of its key terms,[204] what do terms like 'rational use' mean? Article II refers to time periods of two to three decades for a species to recover. Recovery periods are relative, and recovery may not be at all possible for some populations which are short-lived and annual species, like some finfish and squid with a highly variable recruitment rate (the rate at which new fish are added to the exploitable part of the population). If krill is harvested at the 'greatest annual net increment' then this may impact on the predator species, which implies that a lower level of harvesting krill should be an option. Another ecosystem consideration is the non-living factors, such as the nutrient cycle and energy flow of the system. The ecosystem approach is complex and different from single species approaches, involving a vast array of factors and their relationship to each other.[205]

Serious discussion of management approaches started in 1984. "It was agreed that there was a need to consider Article II of the Convention in its entirety."[206] The option considered most appropriate was: "to allow rationalise utilization of resources that have not been over-exploited, within levels which will ensure that any potential detrimental effects are reversible over two or three decades."[207] In 1985 the Ad Hoc Working Group on Ecosystem Monitoring defined the objective of ecosystem monitoring as:

> To detect and record significant changes in critical components of the ecosystem, to serve as the basis for the conservation of Antarctic Marine Living Resources. The monitoring system should be designed to distinguish between changes due to the harvesting of commercial species and changes due to environmental variability, both physical and biological.[208]

In 1985 six indicator species were chosen as being the most useful indicators of food variability and three more were added in 1986.[209] A permanent working group for the CEMP was to be established.[210] Three areas were chosen for monitoring were, Prydz Bay,

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[204] Marinelle Basson and John R. Beddington, "CCAMLR: The Practical Implications of an Eco-System Approach", in Arnfinn Jørgensen-Dahl and Willy Østreng, *The Antarctic Treaty System In World Politics*, Fridtjof Nansen Institute: London, 1991, p.55.
[205] Matthew Howard, op. cit., p.115.
[206] SC-CAMLR-III, 9.2, p.29. Emphasis in the original.
[207] SC-CAMLR-III, 9.10, p.32.
[208] SC-CAMLR-IV, 7.2, p.34.
[209] SC-CAMLR-IV, 7.4, p.35. Crabeater seal, Adelie penguin, Chinstrap penguin, Macaroni penguin, Antarctic fur seal, Minke whale. SC-CAMLR-V, 6.4, pp.30-31. Antarctic petrel, Black-browed albatross, and *Euphausia crystallorophias*.
[210] SC-CAMLR-IV, 7.17, p.39.

the Antarctic Peninsula, and South Georgia.[211] The predator parameters required enough sensitivity to detect changes, at least in the medium term of five to ten years.[212] Prey monitoring focused mostly on Antarctic krill. The need for CEMP land sites to have protection was noted,[213] and in 1990, Conservation Measure 18/IX 'Procedure for According Protection to CEMP' sites was adopted.[214] By 1991 WG-CEMP had largely completed the structure and context of the system for acquiring and reporting data information on predators to the Secretariat.[215] In 1994 WG-CEMP and WG-Krill were replaced by a new Working Group on Ecosystem Monitoring and Management (WG-EMM).[216]

The key considerations of CEMP are whether a predator is affecting the availability of a prey species, and whether change in a predator's population is related to the availability of a fishery. This is done by monitoring selected species of seals and seabirds that are sensitive to changes in the environmental factors. The greatest focus is on krill as the principal food source of fish, seabirds, seals, and whales in the ecosystem of the Antarctic and Southern Ocean region. Currently scientists can tell what individual species are doing, but are still yet to discover the exact ecological links between different species.

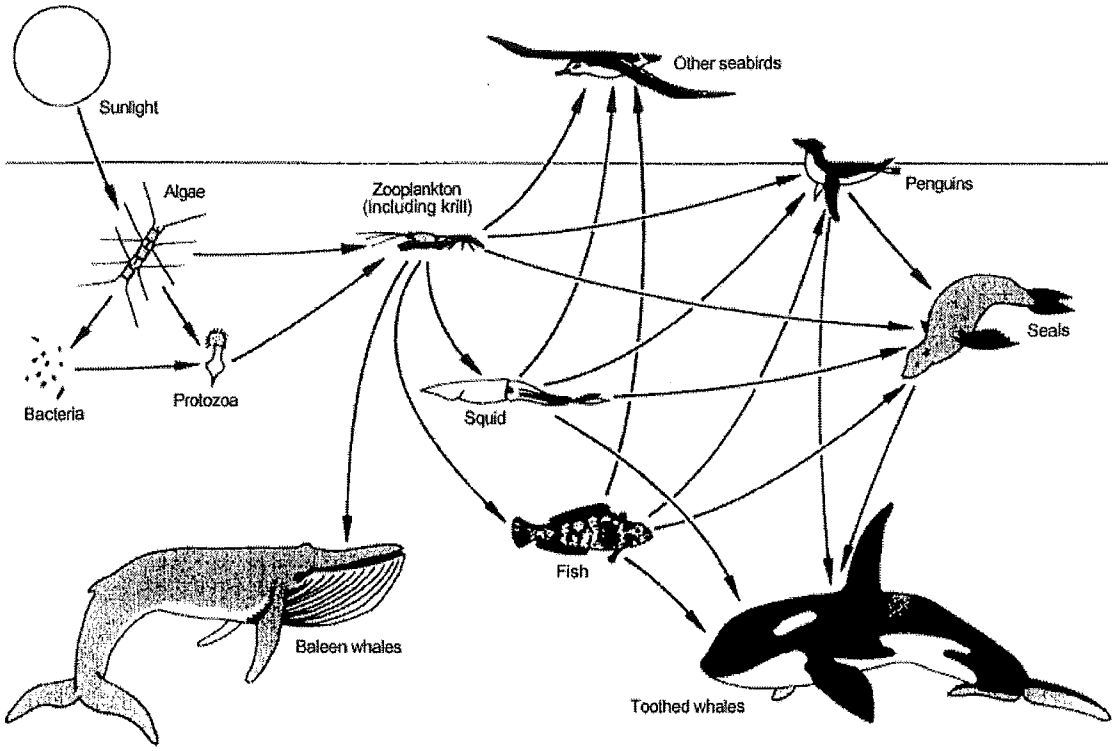
CEMP uses 'feedback management' approach to assess and adjust levels of harvesting so that desired conditions in the ecosystem can be maintained. This approach was considered more desirable by the Scientific Committee than a reactive management procedure.[217] Feedback management involves the continuous adjustment of conservation measures. In the interim while the feedback management system is being developed, a precautionary approach is desirable, and precautionary catch limits should be considered.[218] Data gained by CEMP is used by the Scientific Committee to advise the Commission on how harvesting will affect the ecosystem. A more pragmatic reason for using CEMP data is that it justifies the resources invested in the program. Although CCAMLR is attempting to be a multi-species approach, in the past it has often been little more than an approach combined

[211] SC-CAMLR-V, 6.5, p.31.
[212] SC-CAMLR-VI, 7.5, p.42.
[213] SC-CAMLR-VIII, 5.44, p.39.
[214] CCAMLR-IX, 6.4, p.20.
[215] SC-CAMLR-X, 6.22, pp.47-48.
[216] CCAMLR-XIII, 3.15, p.8.
[217] SC-CAMLR-X, 3.56, p.14. "The Scientific Committee agreed that reactive management does not constitute a viable long-term strategy for management of the krill fishery and that the development of a feedback management procedure for krill should be a long term aim."

of single-species. By 1999 the Krill Yield Model (KYM) still needed further refinement. Establishing useful and precise parameter values is difficult. The Generalised Yield Model (GYM) has been applied to some finfish fisheries.

Figure 3

Simplified trophic relationships in the Southern Ocean[219]



The management problem of the krill fishery would be resolved by successfully answering the question "how much krill can man annually catch in the Southern Ocean without disturbing the marine ecosystem there?"[220] An answer to the question depends on how the degree of disturbance caused by fishing activities is defined. A pure conservation definition would prohibit any fishing activities, which is not in keeping with the conservation objective of CCAMLR to include 'rational use' of the resource. The degree of what is permissible depends on the "politicians and administrators who are responsible for the world economy."[221] Most conventions adopt effective measures and research after a resource has been exploited, and the measures are implemented as damage control. There

[218] SC-CAMLR-X, 3.103, p.23.
[219] Karl-Hermann Kock (ed), op. cit., p.48.
[220] Takesi Nagata, op. cit., p.123.
[221] ibid., p.126.

is still some chance to avoid this with krill. "The critical indicator of CEMP's influence, however, will be in how much the program's findings influence decisions within the Commission – a consideration that ultimately depends on how much individual governments appreciate the validity of those findings."[222]

The Development of Conservation Measures

This section covers the slow development of the conservation measure framework in the 1980s. Rather than exhaustively listing all of the conservation measures it concentrates on key measures, general trends, and new developments. Early on the CCAMLR regime had great difficulty in establishing conservation measures, but by the early 1990s some of the obstacles had been overcome and a large number of conservation measures were being adopted.

Background: the structure of the Convention

The structure within the Convention that can be used to develop and enforce conservation measures is deliberately ambiguous. Few formal prescriptions exist in the Convention. Article X (2) of the Convention spells out some of the possible measures that could be employed, but the range of sanctions in the Convention for ensuring compliance is meagre. Article XI (2) of the Convention requires the Commission to draw the attention of all parties to any activity of a Contracting Party that affects regime objectives, or compliance with regime obligations. Auburn argued that: "This, the only mechanism established by the Convention for dealing with infringements, cannot be seen as an effective sanction."[223] CCAMLR relies on voluntary compliance with conservation measures. Members are responsible for the legal aspects of enforcement, such as the imposition of penalties. As Kock observed: "the structure of CCAMLR is quite weak when it comes to the enforcement of its conservation measures."[224] The deliberate ambiguity in the enforcement provisions of the Convention was employed to avoid the potential conflicts over

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[222] Christopher C. Joyner, op. cit., pp.129-130.
[223] F. M. Auburn, op. cit., p.232.
[224] Karl-Hermann Kock, "Fishing and Conservation in Southern Waters", *Polar Record*, 30 (172), 1994, p.14.

sovereignty.[225] According to Watts it "is the underlying territorial, and thus jurisdictional, difference which explains the judgemental flexibility inherent in the requirement to take 'appropriate' measures, and, even more so, the knowingly ambiguous phrase requiring the State to be acting 'within its competence."[226]

There is a time delay for Conservation Measures to enter into force. CCAMLR Article IX (6) allows ninety days for objections, and then the Conservation Measures become binding on all CCAMLR members after 180 days. Barnes felt that Article IX (6) was superfluous given the consensus voting requirement for the acceptance of conservation measures.[227] Edwards and Heap had a different opinion concerning the objection procedure: "Its necessary purpose is to enable governments to review the arrangements which their representatives have negotiated to see whether they are acceptable."[228] There is a risk that governments could use this as an escape route to avoid unwanted conservation measures. This does not seem to have occurred so far during the operation of CCAMLR. If it ever did it would probably be easier for the objection procedure to be used again in the future: "Frequent use tends to undermine the conservation objectives of conventions which include this sort of procedure."[229]

"The only point that is crystal clear is that no decision making procedure can, of itself, force a state to accept a conservation measure which it deems to be contrary to its vital interests."[230] A decision reached by consensus is less likely to result in the objection provisions being invoked. Since 1988 conservation measures around South Georgia have been binding immediately, and individual members can choose to apply conservation measures immediately after their adoption. The objection procedure, and the consent required to apply conservation measures in EEZ, have been criticised as a double or even triple veto. The objection procedure is related to the conservation-harvesting issue, while the EEZ application is a result of the undisputed sovereignty that is acknowledged for some Sub-Antarctic Islands.[231]

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[225] Matthew Howard, op. cit., pp.139-140.
[226] Arthur Watts, op. cit., p.174.
[227] James N. Barnes, op. cit., p.262.
[228] David M. Edwards and John A. Heap, op. cit., p.357.
[229] ibid., p.358.
[230] ibid.
[231] Francisco Orrego Vicuña, op. cit., p.28.

France, and the other states claiming coastal state jurisdiction in the Convention Area, have taken care when exercising their rights under the convention not to appear to be eroding or otherwise weakening the effect of a conservation measure. France has stated that it reserves the right to impose conservation measures in its maritime zones that are stricter than those required by CCAMLR. The area where this has the most potential to cause trouble is around the disputed territory in the South Atlantic.[232]

The first conservation measures

In 1984 at the third CCAMLR meeting the first two conservation measures were approved. These were Conservation Measure 1/III 'Closure of Waters Adjacent to South Georgia', and Conservation Measure 2/III 'Mesh Size'.[233] In 1985 Conservation Measure 3/IV 'Prohibition of Directed Fishery on Notothenia rossii around South Georgia (Statistical Subarea 48.3)' was adopted. This was the first species specific measure.

At the 1985 meeting three resolutions were also adopted for the protection of *Notothenia rossii* around South Georgia, the Peninsula and South Orkneys, and the Kerguélen Islands.[234] The crucial difference between a resolution and a conservation measure is that the latter becomes binding on all CCAMLR members, unless they exercise the objection clause or express a reservation relating to sovereignty. Resolutions are not mentioned in the Convention. The adoption of a conservation measure or a resolution requires consensus, but because the resolution is not binding it can be easier to acquire consensus on a resolution than it is on a conservation measure. These resolutions generally request member states to take, or not take, an action. A resolution may also be adopted as part of ongoing discussions leading towards the eventual adoption of a conservation measure at a future meeting.

In 1986 it was agreed that Conservation Measures 1/III, 2/III, and 3/IV were to remain in force.[235] A feature of the early CCAMLR system was that conservation measures were usually renewed at each subsequent meeting. This was criticised on the grounds that it could reduce the effectiveness of conservation measures. In 1989 no consensus could be

[232] See Chapter 5, pp.220-222.
[233] CCAMLR-III, 47-49, pp.11-12.
[234] CCAMLR-IV, pp.10-11.
[235] CCAMLR-V, 48, p.13.

reached on the retention of Conservation Measure 1/III so it was not renewed.[236] There was also no consensus on whether or not a review of mesh size (Conservation Measure 2/III) was needed.[237] A counterpoint to this criticism is that it forces the Commission to review the measures in light of new information each year. The Commission does not appear to have reversed the implementation of any conservation measure once it has been implemented, without good reason. They have generally been reviewed and revised, or replaced and subsumed within a new measure. In 1992 it "was noted that conservation measures in force with no time limit are understood to be in force until revoked by the Commission."[238] The system of referencing conservation measures was also noted as becoming unwieldy in 1992,[239] but no change in the referencing has yet taken place. When amending or revising a conservation measure the amended measure has the convention meeting where it was amended replace the meeting code at which it was first adopted.

Conservation Measure 7/V 'Regulation of Fishing Around South Georgia (Statistical Subarea 48.3)' was an important measure because it demonstrated that the CCAMLR Members could adopt measures in a manner which was more effective than allowed by the strict requirements of the Convention. This measure allowed further conservation measures for Area 48.3 to be adopted and implemented immediately rather than waiting for the 180 day period required for objections.[240] One timing problem here is that fishing can take place around South Georgia in August and September, before any CCAMLR meeting can promulgate new measures. However, the Commission is able to apply some measures in retrospect, as happened with Conservation Measure 8/VI 'Limitation of the Total Catch of Champsocephalus gunnari in Statistical Subarea 48.3' which was deemed effective from 1 July 1987 rather than from after the meeting. A different approach was adopted for the Peninsula area with a resolution being adopted which covered the interval until Conservation Measures 5/V and 6/V entered into force.[241]

The first precautionary conservation measures began to occur in the mid-late 1980s. In 1987 Conservation Measure 8/VI applied a TAC of 35,000 tonnes in the 1987/88 season to

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[236] CCAMLR-VIII, 76, p.21.
[237] CCAMLR-VIII, 82, p.23. The measure remained in force.
[238] CCAMLR-XI, 9.5, p.21.
[239] CCAMLR-XI, 15.1, p.49.
[240] CCAMLR-V, 48, p.18.
[241] CCAMLR-V, 48, p.18. Resolution 4/V Protection of Notothenia rossii in the Peninsula Area (Statistical Subarea 48.1) and Around South Georgia (Statistical Subarea 48.2).

C. gunnari in Area 48.3. This was significant for being the first catch limitation measure adopted by the Commission. Another precautionary approach was to prohibit fishing for part of a future season, which was done with Conservation Measure 10/VI 'Prohibition of Directed Fishery on Champsocephalus gunnari in Statistical Subarea 48.3 from 1 April until 1 October 1988'. Conservation Measure 9/VI 'Catch Reporting for Champsocephalus gunnari in Statistical Subarea 48.3', was to help the ability of the Scientific Committee to determine the future catch limits for that species by increasing the requirements for data submission. In accordance with Conservation Measure 7/V these measures became effective immediately. One of the earliest indications of the potential effectiveness of conservation measures was in 1987 when it was noted that "a far greater quantity [of *C. gunnari*] could have been landed if restrictions had not been placed on the fleets in line with last year's undertaking."[242] Some consideration of the interests of the ecosystem rather than those of the fishing industry was shown with the 1989 Resolution 5/VIII 'Protection of Seabirds from Incidental Mortality Arising from Longline Fishing' encouraged the development of techniques to minimise incidental mortality.

An era of expansion of conservation measures

The 1990 meeting adopted ten new conservation measures and the 1991 meeting adopted fifteen new conservation measures. This signified that CCAMLR had entered a period in which its processes were capable of adopting a number of conservation measures, breaking the deadlocks that had existed in the 1980s.[243] A large number of conservation measures were passed that expanded the range of measures taken by CCAMLR. Conservation Measure 27/IX was a complete prohibition of directed fishing for finfish in Statistical Subareas 48.1 and 48.2 for the 1990/91 Season. Conservation Measure 29/X for the minimisation of the incidental mortality of seabirds in the course of longline fishing or longline research in the Convention Area introduced many requirements for fishing vessels, such as sinking hooks, no trash dumping at sea, and placing streamer lines. Conservation Measure 30/X prohibited net monitor cables from the 1994/95 Season. Conservation Measure 31/X requires notification that Members are considering initiating a

[242] CCAMLR-VI, 47, p.13.
[243] Francisco Orrego Vicuña, "The Regime of Antarctic Marine Living Resources", in Francesco Francioni, and Tullio Scovazzi (Eds), *International Law for Antarctica*, Kluwer Law International: The Hague, 1996, p.141 "This evolution evidences that the problem did not lie with voting arrangements *per se*, but with the necessary accommodation of interests and development of confidence in a newly established regime."

new fishery. Conservation Measure 35/X placed a catch limit of 3,500 tonnes on *D. eleginoides* in Statistical Subarea 48.3 for the 1991/92 Season. Conservation Measure 37/X required an effort and biological data reporting system for *D. eleginoides* in Statistical Subarea 48.3 for the 1991/92 Season, and a failure to provide the data would see the fishery closed, although this would take a month to implement.

The 1991 Resolution 8/X 'Protection of the Seal Islands CEMP Site' was followed up in 1992 with Conservation Measure 62/XI 'Protection of the Seal Islands CEMP Site'. Resolution 10/XII in 1993 responded to concerns about the harvesting of straddling stocks, which is important as the Patagonian toothfish is a straddling stock near the Prince Edward, and Crozet islands, and krill around the Kerguélen Islands. Despite a new global agreement the problem with straddling stocks being caught on the high seas remains a concern.[244]

In 1998 the Commission addressed the issue of the timing of the CCAMLR year. The requirement for Members to license vessels to fish in the Convention Area was resulting in a period immediately following the Commission meeting when fishing could not take place due to the need for licenses to be issued consistently with domestic legal requirements. The Commission endorsed a new CCAMLR fishing year, beginning on 1 December of a year and ending on 30 November of the following year, except for a transition year from 7 November 1998 to 30 November 1999.[245]

215 conservation measures were adopted by the Commission in the period from 1982 to 2000. The number of conservation measures in force in 2000/2001 was sixty-one. Twenty-five of these measures are in force indefinitely. Eleven of the measures are indefinite but with a trigger for review by the Commission. Three of the other measures will expire by the end of 2001, with the remaining twenty-two measures expiring by the end of 2001 and but they can also be triggered to expire earlier if for example a by-catch or TAC level is reached. In the same period sixteen resolutions have been adopted by the Commission and there are six resolutions in force indefinitely. A significant proportion of these measures

[244] Christopher C. Joyner, op. cit., p.143.
[245] CCAMLR-XVII, 9.1-9.2, p.35.

and resolutions were directed at resolving the problems of IUU fishing and incidental mortality of seabirds.[246]

Development of a quota system for CCAMLR

The quota issue is one that is linked to the risk of overcapitalisation of a fishery leading to an excess capacity for harvesting. The over-capacity in modern fishing fleets is a significant problem due to the tragedy of the commons problem.[247] Quota allocations are a fundamental measure for conservation, and they were deliberately excluded from CCAMLR because of the sovereignty issue. This has been criticised by Sahurie: "The Commission is empowered to designate the quantity of any species which may be harvested, and this is fundamental in an effective conservation program, but senseless in the absence of provisions on quota allocation."[248] Quotas were not included in the illustrative list of possible conservation measures in Article VIII. However, the list is not all inclusive, so the CCAMLR Commission has the power to pass national quotas. One problem here with single allocation quotas is that it would be easy for another member state to withhold consensus on. Quotas in different sectors of the CCAMLR area will be of interest to the claimants in that area. Writing in 1989, Howard thought it would be interesting to see if catch limitations would only be employed in relation to non-viable fishing areas.[249] Fortunately this did not prove to be the case.

Two of the methods used to control the degree of fishing mortality are to limit the amount of fishing effort or to establish a TAC.[250] Limiting fishing effort requires detailed information about fishing vessels and their operations that is not generally available.[251] Establishing a TAC requires estimates of the current biomass and the strength of incoming recruitment.[252] The first TAC, for *C. gunnari* was established in 1987 as Conservation Measure 8/VI. A TAC limit can be applied immediately, and can be made retrospective.[253] This deals with the problem that fishing for a species which starts before the annual

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[246] See Chapter 5, pp.210-216 for more details about the CCAMLR response to incidental mortality caused by IUU fishing.
[247] See Chapter 3, pp.90-92.
[248] Emilio J. Sahurie, op. cit., p.531.
[249] Matthew Howard, op. cit., p.135.
[250] CCAMLR-VI, 60, p.16.
[251] CCAMLR-VI, 62, p.16.
[252] CCAMLR-VI, 63, p.16.
[253] CCAMLR-VI, 70, p.17. For an example of this, see the last paragraph on p.143 above.

CCAMLR meeting, and the 180 day delay that otherwise affects all Conservation Measures. For a TAC to have the appropriate management effect it is essential to avoid any by-catch of the species for which the TAC has been set in the course of other fishing operations in that area.[254] An effective TAC measure also requires an appropriate reporting system, such as was put in place with Conservation Measure 9/VI for *C. gunnari*.[255]

The actual setting of the TAC level is a problematic exercise that continues to vex decision-making in the Scientific Committee and the Commission. In theory it should be made on the basis of the best scientific advice from the Scientific Committee, but in practice it has often been the subject of bargaining. The fishing members initially favoured a precautionary catch based on historical catches, but other members expressed the view that historical catch figures did not constitute a scientific basis for determining precautionary catch limits.[256] In 1991 Conservation Measure 32/X 'Precautionary Catch Limit for *Euphausia superba* in Statistical Subarea 48.3' was adopted by the Commission with a krill TAC of 620,000 tonnes. This figure was calculated on the average of biomass estimate, plus historical catch limit, plus five percent as a practical interim precautionary measure.[257] This calculation looks like a compromise designed to appease the fishing nations. In general a TAC quota is less likely to attract consensus problems. It can still be a problem for the territorial claimants, for example New Zealand companies have been conducting exploratory fishing in the Ross Sea to establish whether a fishery for Antarctic toothfish is viable, and the possibility of fishing boats from Chile, South Africa, and Uruguay was not welcomed by New Zealand.

Another problem with TACs is that some fish species have a greatly variable recruitment from year to year, so that the available population for harvesting can peak one year and decline sharply the next. It is difficult for the Scientific Committee to give advice on TACs in the absence of information, or when there is conflicting information. When the information is missing the available options are to either close the fishery, or to allow some directed fishery operations to continue.[258] Indirect methods of stock assessment take a long time, and achieving accuracy can be difficult. "However, the rate of exploitation does have

[254] CCAMLR-VI, 71, p.17.
[255] CCAMLR-VI, 74, p.18.
[256] SC-CAMLR-X, 3.106, p.23, and 3.109, p.24.
[257] SC-CAMLR-XI, 2.112, p.21.
[258] SC-CAMLR-VIII, 3.41, p.22.

to be a reasonable fraction of MSY to produce a great enough effect on the stock to be detected, but if the exploitation rate is too high, an excessive stock decline will be likely before any unambiguous signs of overfishing appear."[259] In 1990 a range of possible TACs were suggested for *C. gunnari*, 44,000 – 64,000 tonnes. Most members of the Scientific Committee felt that a range of TACs was not appropriate as a basis for management advice, although the USSR disagreed. Most members would prefer a conservative TAC to be adopted and it was pointed out that the by-catch for other species could be exceeded.[260]

TACs can cause problems due to the fact that fishery closure changes the economic incentives of the fishery. A competitive TAC without national quotas results in a "race for fish" mentality amongst fishers, which can contribute to overcapacity with consequent effects on the environment and for compliance with regulations.[261] This could happen without TACs as well. Heap commented on the Soviet fishing fleet – "In a situation where there was no control on the fishery, their economic interest dictated that they should make the most of it before any other fishing nations got in on the act."[262] The highest value fish were taken first, just like in whaling.

The development of new and exploratory fisheries under CCAMLR

In the mid-1980s some concern was expressed about the definition of 'experimental fishery' and the need for experimental fisheries to be subject to CCAMLR regulations.[263] This was important for the establishment of sustainable management procedures for newly exploited species: "exploratory fishing should not be allowed to expand faster than the acquisition of information necessary to ensure that the fishery can and will be conducted in accordance with the principles set forth in Article II of the Convention".[264] In the 1990s the Commission did not always apply a precautionary principle to the new fisheries, and opened them to exploitation. This was in part due to domestic pressure from fishermen in

[259] SC-CAMLR-IX, Annex V, 170, p.185.
[260] SC-CAMLR-IX, 3.37-3.44, pp.23-24.
[261] Trysh Stone, "Fishing in the Freezer: Challenges for Fisheries Managers in Australia's sub-Antarctic fisheries", in Bateman, Sam., and Donald R. Rothwell, (eds), *Southern Ocean Fishing: Policy Challenges for Australia*, Wollongong Paper on Maritime Policy No. 7, Centre for Maritime Policy, University of Wollongong: Wollongong, 1998, pp.98-99.
[262] John A. Heap, "Has CCAMLR Worked? Management Policies and Ecological Needs", in Arnfinn Jørgensen-Dahl and Willy Østreng, *The Antarctic Treaty System In World Politics*, Fridtjof Nansen Institute: London, 1991, p.49.
[263] SC-CAMLR-VIII, 3.24, p.19, and CCAMLR-VIII, 71, p.21.
[264] SC-CAMLR-XII, 7.1, p.45.

CCAMLR Member states and in part due to a lack of a framework for CCAMLR to deal with the process of establishing a sustainable fishery. Since 1991 the Commission must be notified in advance of initiating a new fishery. Conservation Measure 31/X 'Notification that Members are Considering Initiating a New Fishery' recognised that fisheries had been initiated in the past before information was available for management advice, making it difficult for the Commission to fulfil its Article IX requirements.

In the late 1990s substantial progress was made in this area: reporting was improved; research was required; and the TACs were set at low levels. The need for fisheries to be managed from the outset was becoming recognised and the procedures for doing so were being developed. A new fishery is now designated as an exploratory fishery after its first year.[265] Conservation Measure 65/XII 'Exploratory Fisheries' recognised that in the past fisheries had been initiated and subsequently expanded faster than the acquisition of the information needed for the fishery to be conducted in accordance with Article II. Exploratory fishing requires data collection, and a precautionary catch limit to limit fishing capacity and effort. More uniform criteria have also been developed to deal with 'closed' fisheries, which have been formally closed by conservation measures, and 'lapsed' fisheries, where fishing has ceased for some time.

Summary of trends in conservation measures

The initial procedural problems in the Scientific Committee, and subsequent problems with data submission and interpretation of the evidence, meant that initial proposals for stronger conservation measures were rejected. In 1989, Howard felt that Conservation Measures had "been used sparingly by the Commission and they have contributed little to the protection of the Antarctic marine ecosystem."[266] This was because the measures adopted dealt with species that were so depleted as to not attract economic exploitation, or "they have been adopted with the knowledge that they will not be effective."[267] One reason why non-fishing members would support the passing of a measure that is not going to be effective is the hope that further measures can be passed in the future that will be more

[265] Karl-Hermann Kock (ed), *Understanding CCAMLR's Approach to Management*, May 2000, http://www.ccamlr.org/English/e_pubs/e_app_to_manag/TEXT_final_.pdf, (site visited March 19, 2001), p.28.
[266] Matthew Howard, op. cit., p.131.
[267] ibid.

effective at dealing with the problem. This is another reason why efforts are made to secure agreements to the non-binding resolutions.

The trend in this period, after initial difficulties, was for more and stronger conservation measures to be adopted by CCAMLR. In 1991 Vicuña found that "CCAMLR seems to have completed this initial difficult stage and is now entering the phase where productive policies can be pursued with greater ease."[268] With hindsight this now appears rather optimistic, without even considering the problem of third-parties, the difficulties in the mid-1990s of enforcing conservation measures with the nationals of Contracting Parties was a major problem for CCAMLR. Even at the time they were deemed insufficient by environmentalists.[269]

Compliance and enforcement of conservation measures

In 1987 the procedure to be followed for matters covered by Article X of the Convention was discussed. In such circumstances the Contracting party transmits the relevant information to the Chairman of the Commission, who would in turn transmit such information to the other state involved for comment.[270] In 1988 it was decided that compliance and Article X would be considered at the next meeting of the Commission, and the matter was referred to SCOI. A failure to comply with Conservation Measure 9/VI was noted.[271] In 1989 some consideration was given to the establishment of a Standing Committee on Conservation Measures.[272] This has not been adopted and the discussion of conservation measures occurs in SCOI, the Scientific Committee, and in the Commission. In 1990 the USSR reported violations of Conservation Measure 2/III, and action was taken under Soviet law.[273] The Commission decided that that future violations of conservation measures should follow a procedure where the flag state was to report infractions, the action taken, and any sanctions imposed in detail to the Commission.[274]

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[268] Francisco Orrego Vicuña, "The Effectiveness of the Decision-Making Machinery of CCAMLR: An Assessment", in Arnfinn Jørgensen-Dahl and Willy Østreng, *The Antarctic Treaty System In World Politics*, Fridtjof Nansen Institute: London, 1991, p.28.
[269] Jean-Pierre Puissochet, "CCAMLR – A Critical Assessment", in Arnfinn Jørgensen-Dahl and Willy Østreng, *The Antarctic Treaty System In World Politics*, Macmillan in association with Fridtjof Nansen Institute: London, 1991, p.74.
[270] CCAMLR-VI, 104-105, pp.26-27.
[271] CCAMLR-VII, 132-135, p.37.
[272] CCAMLR-VIII, 38-40, p.9.
[273] CCAMLR-IX, 12.1, p.33.
[274] CCAMLR-X, 8.3, p.20.

Enforcement of the CCAMLR rules relies on the good faith of governments, as the Convention does not provide for sanctions or penalties against parties unwilling or unable to impose sanctions on their nationals and companies. This obviously has the potential to be abused. "This deficiency in CCAMLR's structure weakens the efficacy of the Commission's conservation measures."[275] In the late 1980s there were few conservation measures that required any degree of significant compliance from the CCAMLR members. At this stage CCAMLR was still developing the system of inspection and observation required by the convention.

Development of the System of Inspection and Observation

In order for enforcement to be possible an incidence of non-compliance must first be detected. A system of observation and inspection was not created during the CCAMLR negotiations, although its development was called for in Article XXIV of the Convention. The development of a system of observation and inspection was quite important to the potential effectiveness of CCAMLR, given the difficulty in passing conservation measures and the weakness of enforcement allowed under the Convention. An effective system of inspection would assist with compliance and enforcement, while an effective system of observation would help with acquiring the data necessary for management and conservation measures.[276] The Antarctic Treaty is concerned with inspections on land while CCAMLR is concerned with inspections at sea. Sudden inspections can cause logistic problems for bases on land. Inspections at sea face even greater practical difficulties and can be prevented by environmental conditions. The details of the inspection system were left to the Commission to develop and it was expected to take some time. In the interim Members were to make their own arrangements.[277]

In 1984 it was noted that it would be helpful in the future to draw a distinction between "a system of observation which would relate to the promotion of the objectives of the Convention and ... a system of inspection which would relate to ensuring the observance of the provisions of the Convention."[278] Steps were taken to gather information on existing

[275] Christopher C. Joyner, op. cit., p.141.
[276] CCAMLR-X, 7.5, p.19.
[277] CCAMLR-IV, 25-27, pp.7-8, and see Appendix II, Article XXIV (3).
[278] CCAMLR-III, 26, p.7.

international practice, and to ask advice from the Scientific Committee. In 1985 the United Kingdom introduced a proposal to encourage the placement of scientific observers on commercial fishing vessels.[279] "A clear distinction should be made between scientific observers and inspectors. The scientific observers would not have any role as fisheries inspectors; their role would be solely scientific."[280] This was to be initially established on a voluntary and bilateral basis; although the fishing members preferred a reciprocal basis to the system. The Commission considered whether voluntary arrangements could be considered a fulfilment of the requirements of Article XXIV of the Convention, and preferred to treat them as part of Article XV.[281] In 1986 there was little further progress, with more work expected in the intersessional period, and the concept of voluntary, bilateral arrangements was recalled and re-endorsed.[282] In 1987 a Working Group convened by the United States elaborated a set of provisions for a scheme.[283] France stated that these provisions would not apply in the waters adjacent to Kerguélen and Crozet.[284] Further discussion of the costs of the scheme was needed.[285]

The system of inspection

In 1988 the Commission finally established SCOI, and a set of provisions was adopted to verify compliance with conservation measures in effect under the Convention.[286] Reports on observation and inspection activities are provided to the state that designated an observer, which in turn reports to the Commission.[287] The system was first trialed during the 1989/90 fishing season. In 1990 after some discussion it was agreed that participation in the deliberations of SCOI was for full members of the Commission only.[288] In 1991 it was noted that the system of inspection does not preclude national inspections conducted by Contracting Parties on their flag vessels.

France and South Africa reserved their positions on the application of the inspection scheme around their islands, their objective being to arrange direct bilateral agreements for

[279] SC-CAMLR-IV, 10.1-10.7, pp.47-48.
[280] SC-CAMLR-IV, 10.3, p.47.
[281] CCAMLR-IV, 25, p.7.
[282] CCAMLR-V, 73-76, pp.28-29.
[283] CCAMLR-VI, 94, pp.22-25.
[284] CCAMLR-VI, 97, p.25.
[285] CCAMLR-VI, 100-102, pp.25-26.
[286] CCAMLR-VII, 123-126, pp.29-35.
[287] CCAMLR-VII, 125, Article VIII, p.34.

these areas, not to avoid the observation and inspection systems requirements.[289] In the 1995/96 season thirty-two inspectors were designated, and five inspections were carried out.[290] In general compliance with conservation measures was observed, but with some infringements.[291] Inspections did uncover IUU fishing activities. For example, in 1996 the UK and South Africa discovered illegal fishing activities around South Georgia and Prince Edward Island respectively. While non-compliance is disturbing, the fact that it was detected is good for the system. From 1995, Inspectors can board vessels presumed to have been engaged in fishing, not just those caught in the act.[292] "For some time CCAMLR has been aware that effective enforcement of its conservation measures is essential but that this is extremely difficult given the size of the Southern Ocean and the costs involved in patrolling it."[293]

The system of observation

Consensus was not reached on the observation system until the 1992/93 season because of difficulties in defining the tasks of scientific observers.[294] In the interim the Commission continued bilateral exchanges.[295] The purpose of the scheme is to gather information on fishing activities in the convention area. Observers have to be nationals of the member that designates them, and the scheme has to operate on the basis of bilateral agreements. The presence of observers does not discharge the members from their obligations under Article XX to report information about their fisheries on a regular basis. Article XXIV (2) (c) observers report to their own governments, who make representations to the CCAMLR Commission. The first placement of a scientific observer was in the 1992/93 season between Chile and the UK on the Chilean longliner *Frio Sur V* in the South Sandwich Island area.[296]

In 1997 the Commission decided that when vessels are charted under a joint venture with a non-member flag state, the member flag state assumes responsibility for compliance and

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[288] CCAMLR-IX, 11.2, p.32.
[289] CCAMLR-XI, 6.8, p.18.
[290] See Chapter 6, table 5, p.261.
[291] CCAMLR,*CCAMLR Newsletter*, 18, December, 1996, p.3.
[292] CCAMLR-XIV, 7.22-7.26, pp.25-26.
[293] CCAMLR, *CCAMLR Newsletter*, 17, December, 1995, p.4.
[294] Karl-Hermann Kock, "Fishing and Conservation in Southern Waters", *Polar Record*, 30 (172), 1994, p.14.
[295] CCAMLR-X, 7.8-7.9, p.19.

reporting data.[297] Joint ventures between members can reach their own agreement as to where responsibility lies.[298] The scheme of international scientific observation was noted as having a significant role. The possibility was raised that observers could provide information on vessels fishing in the Convention Area in contravention of CCAMLR conservation measures. One difficulty here is that observers are not supposed to become involved in inspection or compliance related functions.[299] Kock noted that "some members have been concerned that scientific observers, who usually stay onboard a vessel for an entire cruise, could easily become *de facto* inspectors."[300]

In the 1997/98 season data from observers improved in quality and timeliness.[301] The Commission agreed that scientific observers should report factual data sightings of fishing vessels in the Convention Area, however the independence and integrity of scientific observers should not be compromised and their activities should be confined to gathering information and data in support of the Scientific Committee. This data would be submitted at the end of a voyage, not in real time.[302]

Assessment of the system of observation and inspection

The lack of a system at the conclusion of negotiations was a source of some criticism. A system of inspection for the CCAMLR regime was not implemented until 1989/90 despite obligations in the CCAMLR convention, and an observation scheme took until 1992/93 to implement. One reason for the difference in speed of implementation was the greater difficulty in establishing arrangements for observation. While an inspection may only take a few hours observers have to remain with a vessel for the duration of its voyage.[303] Some commentators argued that the system is flawed in that it does not allow for independent monitoring, as the inspectors are appointed by the member states, from their own nationals, and not by the Commission. Joyner argued that "monitoring may be prejudicial in favor of fishermen."[304] Despite these misgivings the system of observation has provided crucial

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[296] SC-CAMLR-XII, 1.16, p.3.
[297] CCAMLR-XVI, 8.17, p.27.
[298] CCAMLR-XVI, 8.15, p.27.
[299] CCAMLR-XVI, 8.19-8.20, p.27.
[300] Karl-Hermann Kock, op. cit., p.15. Emphasis in the original.
[301] CCAMLR-XVII, 8.12, p.33.
[302] CCAMLR-XVII, 8.16, p.34.
[303] Jean-Pierre Puissochet, op. cit., p.75.
[304] Christopher C. Joyner, op. cit., p.139.

information to CCAMLR concerning the effectiveness of its conservation measures as well as providing more accurate information on the Southern Ocean to the Scientific Committee.

The inspection system relies on opportunity as the means for its action, so inspections are done haphazardly. Remoteness from the fishing grounds, logistical difficulties, and the high costs of maintaining inspection vessels mean that "the implementation of such a system involves logistics and costs that are almost prohibitive unless there is a backing of strong national interests."[305] Joyner found that "such national commitment is often found wanting."[306] Inspection does not affect non-CCAMLR members operating on the high seas. The use of remote sensing methods, such as a Vessel Monitoring System (VMS), while not as effective a deterrent as field inspections, offers a potentially cheaper, and wider tracking scope for surveillance. This is not a new idea, being suggested at least as early as 1987.[307] The number of issues being dealt with by SCOI grew over time as SCOI become a clearing house for discussion of key new conservation measures. "If managed sensitively and effectively the system should provide an important source of information on the overall impact of fishing and research activities in the Antarctic in addition to monitoring compliance with measures in force."[308]

The Assessment of CCAMLR in the Early Period

Assessments of CCAMLR have varied over the years. Assessments following the negotiations for the Convention were mixed. Pessimism continued to a large extent as CCAMLR struggled to establish a framework of conservation measures, and to establish the relationship between the Scientific Committee and the Commission. A degree of optimism returned in the early 1990s as CCAMLR overcame many of its initial difficulties.

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[305] Karl-Hermann Kock, op. cit., p.14.
[306] Christopher C. Joyner, op. cit.
[307] SC-CAMLR-VI, 7.13, p.44, "It was clear that remote sensing using satellites ... will play an increasingly important role in the acquisition of key environmental data."
[308] Darry Powell, op. cit., p.68.

Assessment at the conclusion of negotiations

CCAMLR received strong initial support from many quarters because it appeared to be an effective mechanism for the conservation of Antarctic marine living resources, and on political grounds, because it has dealt effectively with opposing positions on national claims.[309] The question that most writers attempted to answer about CCAMLR when it was negotiated was whether it was a fishing or a conservation convention: "the issue of conservation strategies versus harvesting goals has been underlying all discussions on the effectiveness of CCAMLR."[310] This basic split in views is reflected throughout the articles of the Convention, and in all ensuing political arguments. The balance of the views are that the Convention favoured the fishing interests over those of conservation. Early after the CCAMLR negotiations were concluded, Barnes reached the conclusion that the Convention: "is a limited-purpose effort that leaves resolution of the critical juridical issues to the future, and that creates serious problems from the standpoint of sound environmental controls and decisions."[311]

However, not everyone was so pessimistic. Josyane Couratier wrote that "some sectors have been inclined to regard the Canberra Convention [CCAMLR] as a text designed to protect the Antarctic environment rather than as a fishing convention."[312] As the Hon. Michael Hodgman put it at the opening ceremony address of the first meeting of the Commission:

> the opportunity that now presents itself requires a commitment to conservation needs of a kind not previously encountered .... a unique chance to show that control mechanisms can be devised, and put in place, before harvesting reaches a point where it could raise risks for the harvesting of krill and dependent species.[313]

In an open-access situation few measures are likely to be acceptable without unanimous agreement. Measures need to be introduced quickly, before excess capacity is built up. As Gulland put it: "the aim should be to have to do little more than put the brakes on

[309] Peter D. Oelofsen, Alexandre Kiss, James Barnes, and Yoon Kyung Oh, op. cit., pp.235-236.
[310] Francisco Orrego Vicuña, op. cit., p.25.
[311] James N. Barnes, op. cit., p.240.
[312] Josyane Couratier, op. cit., p.147.
[313] CCAMLR-I, Annex B, p.2.

development as the optimum harvesting rate is approached rather than to have to cut back on overcapacity, with all the economic and social problems this is likely to bring about."[314]

Assessment while CCAMLR struggled to establish its framework

As the years unfolded and meetings continued, new assessments began to be written about the performance of CCAMLR. Assessments from within CCAMLR focused on the difficult nature of the tasks required for implementation, such as this part of the opening statement in 1983: "It would perhaps have been optimistic to expect to introduce a management system unlike any already in existence without a long and arduous process of preparation.",[315] and from the Chairman in 1984: "we are now commencing a phase in which principles may be established and machinery put in place to achieve the objectives of the Convention."[316] The caveat mentioned the year before by the Chairman was that: "The credibility of the Convention will, in large measure, depend on the speed and effectiveness with which it is implemented."[317] In this respect visible progress was slow, but as Gulland put it:

> Conservation interests may well believe that the commission is working slowly, and the measures so far taken and contemplated ... are more cosmetic than real. However, the commission is moving toward more effective measures and toward the collection of data that would enable these measures to be soundly based. This is clearly preferable to the only likely alternatives, which would be the absence of any commission, or a commission dominated by conservation interests but ignored by the fishing nations.[318]

The first three meetings produced limited results and its achievements fell short of the aims of the CCAMLR.[319] The slow pace in implementation could have potentially discredited CCAMLR. However, the 'noise' in the Scientific Committee and the Commission about the data problems, and the still typical secrecy of the ATS regime at that time, obscured any lack of political will for pressing forward with conservation measures. As CCAMLR was still acquiring information that was not yet considered sound enough for scientific judgement by all the Commission members, any immediate decision could set a bad

[314] John A. Gulland, op. cit., p.224.
[315] CCAMLR-II, Annex B, pp.30.
[316] CCAMLR-III, Chairmans Report, Annex C, 1, p.31.
[317] CCAMLR-II, Report of the Chairman for 1983, Annex D, pp.36.
[318] John Gulland, op. cit., p.230.
[319] Peter D. Oelofsen, Alexandre Kiss, James Barnes, and Yoon Kyung Oh, op. cit., p.237.

precedent.[320] What was achieved in only eight meetings from 1982-1990, was considered a remarkable record given that "the Scientific Committee very nearly did not start at all."[321]

The frustrating early difficulties were part of the process of establishing communication. The level of cooperation depended on the issue "and on most issues there is a distinct difference of attitude from the fishing Members and the non-fishing Members."[322] Criticism of inadequate conservation measures was to a large extent placed on the decision-making machinery and procedures of CCAMLR, with reference to the consensus procedure, and the weak arrangements that were made for observation, inspection, and enforcement.[323]

Jean-Pierre Puissochet argued that the consensus based decision making process is one which still sees the opinion of the Scientific Committee rejected, and conservation measures rejected or watered down.[324] Because the regime permits activity unless prohibited the consensus based system is biased against those that wish to regulate an activity. In 1990 Bush wrote that "The point is illustrated by the current difficulties of the Antarctic Marine Living Resources Commission in reaching agreement on conservation measures that the great majority of the members are willing to accept."[325] However, linking the success or failure of CCAMLR to voting evades reality. CCAMLR attempts to avoid conflict through scientific effort that will allow the adoption of enlightened decisions. As Sahurie noted: "Paradoxically, a great achievement is that in the Antarctic Treaty System all the instruments have been negotiated by consensus."[326]

CCAMLR was initially greeted with relief, expectation, and scepticism. The scepticism was based on performance of other international conservation conventions and "from those who believed the Convention to be fundamentally flawed in its requirement for consensus decision-making."[327] Progress has been made and expectations remain steady. In 1990 Powell believed that "It is too early to say if CCAMLR will go the way of the others."[328]

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[320] ibid., pp.240-241.
[321] Darry Powell, op. cit., p.68.
[322] ibid., pp.68-69.
[323] Francisco Orrego Vicuña, op. cit., p.25.
[324] Jean-Pierre Puissochet, op. cit.
[325] W. M. Bush, op. cit.
[326] Emilio J. Sahurie, op. cit., p.537.
[327] Darry Powell, op. cit., p.61.
[328] ibid.

And that "no instance comes readily to mind, in the seven years of operation, where the consensus method has impeded the work of the Commission, whereas it is easy to recall decisions which might not have withstood the objection process under a voting system."[329]

Has the principle of consensus decision-making been too costly? Some writers have thought so. "Decision-making by consensus demonstrated that cost by paralyzing the Commission for more than half a decade."[330] However, a majority vote system proved unacceptable to the fishing states involved in the CCAMLR negotiations. Vicuña saw the key issue as the "integration of science and technical knowledge into the decision-making process".[331] These efforts were ongoing and incremental, and a true test of the CCAMLR system would only be possible after considerable evolution of the institution. However, as the experience of the IUU fishing problem in the 1990s demonstrated the decision-making system was still capable of preventing a rapid response to a clear problem. The test posed by this problem may allow a more meaningful assessment of the costs and benefits of the consensus system after nearly two decades of operation.

Assessment of the established framework

In 1991 Vicuña felt that CCAMLR was moving towards the demanding standards of effectiveness that had been laid down by Barnes in 1982.[332] At the same time Heap wrote that there was no simple answer to the question "Has CCAMLR worked?"[333] In part it depends on where you stand on the issues of conservation and harvesting. Scientists, environmentalists, fishers, and government officials from different states all have a different perspective on the problems. Heap stressed the importance of dealing with potential problems before capital was invested and economic exploitation takes place,[334] and noted that it was possible to conclude that CCAMLR has worked for krill "so far", but this was not related to CCAMLR conservation measures but to other factors.[335] In 1992 Nicol noted that "the Commission can act with alacrity when its members perceive that the

[329] ibid.
[330] Christopher C. Joyner, op. cit., p.127.
[331] Francisco Orrego Vicuña, op. cit., p.26.
[332] ibid., p.35. See p.127 above for James Barnes formulation.
[333] John A. Heap, op. cit., p.43.
[334] ibid., pp.43-46.
[335] ibid., p.47.

need is there .... CCAMLR is now in a position to begin realising its potential."[336] The ecosystem approach was being handled by breaking it down into tractable portions. This was a realistic approach to the problem, but it has the risk of the Commission developing strategies of only managing individual species rather than trying to manage the ecosystem as a whole.

In 1994 Karl-Hermann Kock wrote that the practical and political problems that might affect the implementation of CCAMLR's principles, "have thus far affected the performance of CCAMLR less than might have been envisaged."[337] The issue of managing the ecosystem as a whole had been circumvented by dividing the problem into tractable portions, managing individual parts of the ecosystem. "The practical and political problems may become increasingly important when more sophisticated ecosystem models and strategies are developed."[338] The krill catch had remained low compared with initial predictions of its potential yield.[339] In 1996 Rothwell found that many of the institutional problems seem to have been resolved and this "demonstrates that over time the strength and ambit of Conservation Measures have continually been expanded and strengthened."[340] At that time there were no concerns over the potential of overfishing in the Southern Ocean resulting in substantial damage to the ecosystem. CCAMLR appeared to have been a success.[341] Vicuña found the CCAMLR results impressive despite early difficulties, the right approaches were being taken even if there was a lot of work to do.[342]

The views of two groups are well represented in CCAMLR; the harvesting and non-harvesting states. As Heap phrased it: "The harvesters see the non-harvesters as being out to frustrate their legitimate economic interests. The non-harvesters see the harvesters as being out to rape the resource."[343] Science is supposed to harmonise the different views, but this can make science itself contentious as happened during the development of

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[336] Stephen Nicol, "Management of the Krill Fishery: Was CCAMLR Slow to Act?", *Polar Record*, 28 (165), 1992, p.156.
[337] Karl-Hermann Kock, op. cit., p.10.
[338] ibid.
[339] ibid., pp.10-11.
[340] Donald R. Rothwell, *The Polar Regions and the Development of International Law*, Cambridge University Press: Cambridge, 1996, p.310.
[341] ibid., pp.313-314.
[342] Francisco Orrego Vicuña, "The Regime of Antarctic Marine Living Resources", in Francesco Francioni, and Tullio Scovazzi (Eds), *International Law for Antarctica*, Kluwer Law International: The Hague, 1996, p.157.
[343] John A. Heap, op. cit., p.51. Commented that the provision which would reverse the assumption that fishing should be permitted until proven harmful is present in CCAS, p.52.

CCAMLR. Harvesting states tried to maximise their access to the resources with the minimum amount of regulation. The TAC limit set on krill in 1991 was considered by Joyner in 1998 to be an important step towards achieving precautionary management in an uncertain biological environment: "the reactive management policies of the 1980s are now viewed by Commission members as unduly capricious. Such reactive policies might be sufficient to remedy a declining situation, but they are unable to deal adequately with severe threats to the Antarctic marine ecosystem."[344] However, Joyner felt that overall CCAMLR was a successful conservation instrument because of its coverage in the Southern Ocean and its strong efforts to decrease incidental mortality rates.[345] The consensus system serves to promote negotiated compromise. The mechanics of the inspection system affect CCAMLR effectiveness.[346] Writing just before IUU fishing became a very public problem Joyner made the assessment that: "For the *foreseeable* future, exploiting Antarctic fisheries is apt to be viewed more as commercial risk than a lucrative economic opportunity."[347]

Heap wrote "all that can be said is that CCAMLR is working and that its effectiveness is improving."[348] Bearing in mind the proviso that: "The convention will only be as effective as member states want it to be."[349] As Barnes pointed out, CCAMLR "will work only if all parties exercise restraint and common sense."[350] Restraint was more or less exercised in the early period if you are willing to discount, as many writers have, the exploitation that occurred before CCAMLR entered into force. Conflicting economic and conservation interests in the 1980s hampered the initial effectiveness of CCAMLR. In the early 1990s these tensions appeared to have abated as a wave of conservation measures were adopted and with the lack of fishing CCAMLR appeared to be effective. A lack of urgency attended the development of measures for squid, crabs, and krill. This was due in part to the low commercial values of the species being harvested at the time, something which changed with the development of IUU fishing for toothfish. The problem of IUU fishing has reintroduced the tension between economic and conservationist interests and highlighted the problem of significant third-party involvement in the Southern Oceans.

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[344] Christopher C. Joyner, op. cit., p.138.
[345] ibid., p.141.
[346] ibid., p.142.
[347] ibid., p.143. Emphasis added.
[348] John A. Heap, op. cit., pp.50-51.
[349] Christopher C. Joyner, op. cit., p.146.
[350] James N. Barnes, op. cit., p.268.

CHAPTER 5

CCAMLR And The Limits Of 'Rational Use'

New fisheries have developed under CCAMLR management in the 1990s, but in tandem with the increasing legitimate fishery has come the rise of IUU fishing and the associated problem of incidental mortality among seabirds in the Southern Ocean. CCAMLR has pressed the limits of the concept of 'rational use' of the resources in the Southern Ocean by continuing to authorise expanded fishing activities while some of the living resources involved were being pushed to the brink of extinction. Maintaining a legal fishery, despite calls from environmental groups for a moratorium on harvesting toothfish, is making it difficult for the goal of precautionary management of the ecosystem to be achieved.

The concept of rational use is contained within Article II of the Convention: "1. The objective of this Convention is the conservation of Antarctic marine living resources. 2. For the purpose of this Convention, the term 'conservation' includes rational use." Exactly what 'rational use' means is not explicitly covered in the Convention, although the principles in which harvesting activities are supposed to be conducted in accordance with give some indication of what was expected.[1] The phrase was included to help secure the agreement of the fishing states to the Convention. At the 1987 CCAMLR meeting it was noted that there was a need for a common understanding of the term rational use and that: "this term would require progressive refinement as knowledge and understanding of the Antarctic marine ecosystem developed."[2] In 1988 the following definition for rational use was derived: "that harvesting on a sustainable basis means that harvesting activities are so conducted as to ensure that the potential for achieving the highest possible long-term yield is preserved, subject to the principles of conservation above".[3]

The members of CCAMLR with an interest in fishing have taken care to preserve their interpretation of the objectives of the Convention. For example, in 1995 Japan expressed its belief that Article II should not be interpreted so as to place the needs of predators over

[1] Appendix II, Article II (3).
[2] CCAMLR-VI, 113, p.29.
[3] CCAMLR-VII, 139, p.38.

the interests of fisheries.[4] The tension between the conservation and economic goals of the CCAMLR regime created by the ambiguity of Article II of the Convention requires a difficult balancing act under the consensus decision-making procedures of CCAMLR if both goals are to be achieved. During the early period of CCAMLR the Commission favoured rational *use* of the resources rather than *rational* use. It now appears that harvesting activities are actually being conducted to an extent such that the highest possible long-term yield is being reduced, and that it is reasonable to question whether this harvesting is sustainable, either for the species targeted or the dependent species in the ecosystem. It may now be the case that in order to preserve the goal of rational use CCAMLR must act so as to attain the conservation goals first. This chapter will attempt to demonstrate how CCAMLR has reached the limits of its historical usage of the rational use objective.

The New Fisheries in the Southern Ocean

In the 1990s the Southern Oceans began attracting commercial interest in developing fisheries for crab and squid. The Patagonian toothfish which had previously been harvested as by-catch in earlier finfish fisheries also began to attract a high level of interest in its own right.

The crab fishery

The first expression of interest in harvesting stone crabs (*Lithodidae*) was when the United States issued a permit for *MV Marlin* for the 1990/91 Season in Statistical Subareas 48.1, 48.2, and 48.3 with a 1,000 tonne limit. Concern was expressed at the 1990 CCAMLR meeting over the issuing of this permit and size of the take, which if taken in one area, had the potential to cause localised extinctions.[5] The following year an experimental crab fishery for the 1991/92 season, with a 400 tonne catch limit, of which no more than 80 tonnes was to be caught per canyon, was approved for the United States.[6] During the 1992/93 season 299 tonnes of crabs were caught around South Georgia and the Shag

[4] CCAMLR-XIV, 4.32, p.14. The UK also noted in 4.32 that Article II does not give primacy to either dependent or harvested species, but does require precautionary provisions to protect dependent species.
[5] SC-CAMLR-IX, 15.7-15.8, pp.64-65.
[6] SC-CAMLR-X, 5.6-5.9, pp.42-43.

Rocks.[7] The crab fishery has continued sporadically since then, 479 tonnes were harvested in the 1994/95 and 1995/96 seasons combined, but the vessel involved surrendered its permit as its managing company did not consider the fishery to be economically viable.[8] Despite a catch limit for the 1998/99 season set at 1,600 tonnes,[9] no harvesting was conducted. Some limited fishing of four tonnes occurred in Subarea 48.3 in September 1999.[10] It appears that greater profits can still be made elsewhere at the moment.

The squid fishery

Squid is difficult to catch but holds potential as a fishery in the Southern Ocean. Substantial squid fisheries exist elsewhere in the world. Squid is an important predator species in the Southern Ocean. Squid do not appear to have been significantly exploited in the Southern Ocean before CCAMLR entered into force. In 1984 the Scientific Committee felt that more research on squid was needed.[11] In 1988 it was noted that no commercial catch had been reported in CCAMLR waters since a GDR vessel caught two tonnes in Subarea 48.1 in 1979.[12] At the same meeting the UK reported possible squid fishing near South Georgia by a ship not reported by an CCAMLR member – possibly from a non-member country.[13] In February 1989, exploratory fishing took place with two Japanese squid jigging vessels in Subarea 48.3. A total of 8.23 tonnes of *Martialia hyadesi* was caught, but the fishery was thought unlikely to expand due to the limited market potential of *M. hyadesi*.[14] A Taiwanese vessel may have been doing some fishing and there was some discussion of the need for some kind of mechanism to get data from non-member nations,[15] and the Secretariat was to look at ways of doing this.[16] No members reported squid fishing in 1990, although the UK reported sighting seven squid-jigs around South Georgia in January 1990.[17] In 1995/96 fifty-two tonnes of *M. hyadesi* was caught in an experimental fishery in Subarea 48.3, and this was considered the first significant catch in

[7] SC-CAMLR-XII, 4.1, p.36.
[8] CCAMLR-XV, 8.69, pp.43-44.
[9] CCAMLR-XVII, 9.38, p.40.
[10] CCAMLR-XVIII, 4.6, p.8.
[11] SC-CAMLR-III, 9.9, p.31.
[12] SC-CAMLR-VII, 4.1, p.21.
[13] SC-CAMLR-VII, 4.2, p.21.
[14] SC-CAMLR-VIII, 4.1, 4.2, and 4.4, p.29.
[15] SC-CAMLR-VIII, 4.3, p.29 and 4.6, p.30.
[16] CCAMLR-VIII, 54, p.14. In 1990 the Secretariat reported back that it would first determine the vessel flag, and then attempt to contact the appropriate authority. CCAMLR-IX, 10.1, p.31.
[17] SC-CAMLR-IX, 4.1-4.2, pp.33-34.

the Convention Area.[18] The UK and Korea proposed an exploratory fishery for *M. hyadesi* in Subarea 48.3 at CCAMLR-XVII.[19] One problem with squid fisheries is the high annual recruitment rate, which makes TAC allocation difficult as the squid biomass can vary significantly between different seasons. Like the crab fishery, interest in squid has been sporadic and the potential of the fishery is yet to be realised. If there has been unregulated fishing for squid, then the impact has so far been minor.

The toothfish fishery

There are two species of toothfish in the Southern Ocean that have been targeted for harvesting. The Patagonian toothfish (*Dissostichus eleginoides*, or *D. eleginoides*) is widely distributed around Antarctica up to Sub-Antarctic waters and can be found as deep as 2,500 to 3,000 metres. Older specimens can reach two metres in length and weigh over 100 kg.[20] It reaches sexual maturity between six to nine years when it is around seventy to ninety-five centimetres long. Unlike the crab and quid fisheries it has proven commercially viable to harvest toothfish and its value has been likened to "bars of gold".[21] The Antarctic toothfish (*Dissostichus mawsoni*, or *D. mawsoni*) is confined to the waters around the Antarctic continent at depths of up to 800 metres. Like the Patagonian toothfish, it feeds on a variety of other fish, octopods, squid, and crustaceans.[22] Antarctic toothfish have been the subject of new and exploratory fisheries since 1996/97, while harvesting of the Patagonian toothfish started as incidental catch in trawling fisheries directed against other finfish species in the 1970s. In 1984 the reported catches of Patagonian toothfish were very small as there was no directed fishery and the catch was primarily of juveniles.[23] Most of this catch was taken in Subarea 48.3.[24] Longlining for Patagonian toothfish in the

[18] CCAMLR, *CCAMLR Newsletter*, 18, December, 1996, p.1.
[19] CCAMLR-XVII, 7.12, p.30.
[20] Karl-Hermann Kock (ed), *Understanding CCAMLR's Approach to Management*, May 2000, http://www.ccamlr.org/English/e_pubs/e_app_to_manag/TEXT_final_.pdf, (site visited March 19, 2001), p.33.
[21] Stan Crothers, "Trends and Discontinuities in Fisheries" in Graeme Tetley (editor) *Antarctic 2010; a Notebook: Proceedings of the Antarctic Futures Workshop 28-30 April 1998*, Christchurch: Antarctica New Zealand, (Antarctica New Zealand Miscellaneous Series no.3.), 1998, p.16.
[22] Karl-Hermann Kock, op. cit.
[23] SC-CAMLR-III, Annex 8 Report of Ad Hoc Working Group in Fish Stock Assessment, 6-7 September, 1984, p.205.
[24] SC-CAMLR-VII, Annex 5, Report of the Fish Stock Assessment Working Group, table 2, p.97. D. eleginoides catches reported in Subarea 48.3 (South Georgia) 1976/77 441, 1977/78 635, 1978/79 70, 1979/80 255, 1980/81 239, 1981/82 324, 1982/83 116, 1983/84 109, 1984/85 285, 1985/86 564, 1986/87 1,199, 1987/88 1,809 tonnes.

Convention Area definitely started no later than the 1988/89 season,[25] when the Soviet Union began the first longline fishery in the Southern Ocean, targeting Patagonian toothfish in the South Georgia area.[26] Some experimental longlining may have occurred as early as 1985/86 but by 1989 it was no longer an exploratory fishery but a developing commercial fishery.[27] In 1988/89 almost all the catches were by longline.[28] The exception was the trawl based fishery around McDonald Island.

Table 2

Reported toothfish catch in tonnes 1989/90 to 1999/00[29]

Year	*Dissostichus eleginoides*	*Dissostichus mawsoni*
1999/00	13,689	751
1998/99	17,278	296
1997/98	11,170	42
1996/97	10,371	-
1995/96	8,740	-
1994/95	8,911	-
1993/94	5,648	-
1992/93	5,788	-
1991/92	12,497	-
1990/91	5,613	0
1989/90	9,380	1

Conservation measures for toothfish developed slowly. No consideration was given to management action for Patagonian toothfish in 1985.[30] In 1988 the WG-FSA suggested conservation measures were needed for toothfish.[31] In 1989 the WG-FSA expressed concern about the quality of the USSR reports for *D. eleginoides* in Subarea 48.3, and a new data format was developed that could account for longline fisheries.[32] At the same meeting there was concern about the catch levels in Subarea 48.3 increasing by a factor of four over two years, when the WG-FSA was unable to assess the status of the stock.[33] It

[25] See CCAMLR-VIII, 24, p.5.
[26] Janet Dalziell and Maj De Poorter, "Seabird Mortality in Longline Fisheries Around South Georgia", *Polar Record*, 29, (169), 1993, p.143.
[27] SC-CAMLR-V, 4.38, p.14.
[28] SC-CAMLR-IX, Annex V, 155, p.180.
[29] CCAMLR 2000, *Statistical Bulletin*, Vol. 12 (1989-1999), CCAMLR: Hobart, Australia, and CCAMLR, *CCAMLR Newsletter*, 22, January 2001.
[30] SC-CAMLR-IV, 4.17, p.9.
[31] SC-CAMLR-VII, 109, p.136.
[32] SC-CAMLR-VIII, 3.10-3.12, p.16.
[33] SC-CAMLR-VIII, 3.42, p.23.

was also noted that: "Experience in other fisheries outside the CCAMLR Convention Area indicates that assessment of longline fisheries is difficult with little indication of overfishing becoming apparent until the stock is near to collapse." [34] The USSR did not agree that a TAC for *D. eleginoides* was necessary in Subarea 48.3 in the 1989/90 fishing season as they were only planning on using six to eight vessels.[35] In the following season the USSR used only six to eight vessels; yet this did not stop the catch doubling to 8,311 tonnes.[36] There was some discussion of the utility of effort controls, and it was considered that further expansion of the number of vessels taking part would not be appropriate.[37]

There were some limited successes in establishing a conservation framework, overcoming some research and information gathering problems. In 1990 essential monitoring information was not provided, and it was considered a high priority to get scientific observers onto commercial fishing vessels.[38] By 1992 data reporting from Subarea 48.3 about *D. eleginoides*, after Conservation Measure 36/X and Conservation Measure 37/X were adopted in 1991 had been prompt and comprehensive.[39] Every vessel had an observer on board, and this was providing a high quality and quantity of data. The entry of the Chilean fleet led to a shortened fishing season in 1990/91, and with a TAC of 3,500 tonnes the total catch was 3,703 tonnes. This included 133 tonnes caught on research vessels.[40] The research cruise occurred after the fishery was closed in accordance with Conservation Measure 35/X, prompting clarification of research exemptions.[41] Research fishing, while essential, can interfere with conservation efforts if not carefully regulated.[42]

Difficulties were encountered in attempting to set TACs for toothfish. A TAC range of 1,200 to 8,000 tonnes was suggested, with most members supporting a TAC in the lower part of the range, with the USSR preferring a TAC in the middle of the range.[43] It was noted that fishing had continued since the end of June 1990, and that the level of fishing

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[34] SC-CAMLR-VIII, 9, p.184.
[35] CCAMLR-VIII, 106, pp.27-28.
[36] CCAMLR-IX, 13.30, p.37.
[37] SC-CAMLR-XI, 3.14-3.16, p.25., and 3.80, p.36.
[38] SC-CAMLR-IX, 3.55-3.66, pp.25-27, and SC-CAMLR-XI, 3.9, p.24.
[39] CCAMLR-XI, 4.3, p.7.
[40] SC-CAMLR-XI, 3.3, p.23.
[41] SC-CAMLR-XI, 3.27-3.30, pp.27-28.
[42] CCAMLR-XI, 9.9, p.22.
[43] SC-CAMLR-IX, 3.58-3.60., p.26. "This was challenged by the USSR on the basis that this fishery only takes senescent fish (CCAMLR-VIII, paragraph 106), an assertion now known to be incorrect (SC-CAMLR-IX, paragraph 3.56), and no TAC was set." CCAMLR-IX, 13.29, p.34.

before the meeting had the potential to pre-empt any TAC that might be set – an unacceptable situation.[44] It was reported that from 1 July 1990 to 15 October 1990 the USSR had caught 1,440 tonnes of *D. eleginoides* in Subarea 48.3. This catch was greater than a possible TAC and "such a catch rate, in comparison with that prevailing last year, suggests that the stock may already be significantly depleted."[45] There was no estimate of the total biomass, in part because the mature fish is semi-pelagic.[46] Samples of USSR harvested longline fish were found developing towards a spawning condition, which meant that: "the assertion that the longline fishery takes senescent fish (CCAMLR-VIII, paragraph 106) is almost certainly in error."[47] A UK proposal for a catch limit on *D. eleginoides* failed, and no consensus could be reached on whether the decision could be made by correspondence.[48] In 1992 the EEC noted that the TAC had been exceeded, and that conservation measure infractions may have occurred, and there was a potential problem of increased effort. The EEC wanted a TAC of 3,000 tonnes while Chile said it wanted a higher TAC. Russia wanted the TAC to be divided among fishing states because its geographical distance meant that Russian vessels had a long way to sail to reach a fishery when it opened. This idea was opposed by Chile, Argentina, and the EEC. They finally compromised by spreading the TAC allocation over three time bands.[49]

As the Patagonian toothfish fishery developed interest in the other finfish fisheries waned. In the 1992/93 season the only reported finfish catches were for 3,049 tonnes of *D. eleginoides* from Subarea 48.3, 39 tonnes from Subarea 48.4, and 2,722 tonnes from Division 58.5.1.[50] In the 1995/96 season the reported finfish catch was 8,826 tonnes and 99% of this was toothfish – despite there being catch limits available for other finfish species. In the 1996/97 season of 10,562 tonnes reported finfish catch, 97% of this catch was toothfish.[51] These figures do not take into account the unreported fishing. The number of members participating in the fishery also started increasing. In 1991 Chile announced its intention to longline in Subarea 48.3,[52] and its geographical proximity is one the reasons why Russia was displaced as a leading harvester of toothfish. At the twelfth CCAMLR

[44] CCAMLR-IX, 13.32-13.33, p.37. and SC-CAMLR-IX, 3.62, p.26.
[45] CCAMLR-IX, 13.34-13.35, pp.37-38.
[46] SC-CAMLR-IX, Annex V, 160, p.181.
[47] SC-CAMLR-IX, Annex V, 161, p.181.
[48] CCAMLR-IX, 2.3, p.2.
[49] CCAMLR-XI, 9.27-9.34, pp.24-26.
[50] SC-CAMLR-XII, 3.1, p.21.
[51] CCAMLR-XVI, 4.7, p.5.
[52] SC-CAMLR-X, 4.60, p.32.

meeting Russia, Poland, Chile, Korea, Ukraine, and France all expected vessels to possibly fish for toothfish in the 1993/94 season.[53] In 1995 the Commission noted the increasing interest in *D. eleginoides*.[54] By this time extensive IUU fishing had begun to develop in the Southern Ocean.

The Rise of IUU Fishing in the Southern Ocean

Despite attempts by CCAMLR to regulate the toothfish fishery, harvesting activities in the Southern Ocean outran the ability of the Commission to control them during the 1990s. Three phases can be identified in the development of IUU fishing. In the first phase the IUU fishing was largely restricted to South American operators. In the second phase IUU fishing expanded to involve European operators from the 1994/95 season. In the third phase the IUU fishing attracted public attention in 1997 as it expanded eastward across the Indian Ocean.

The first phase of IUU fishing in the Southern Ocean

In 1990 Dr Kock expressed concern about a fishery developing on a bank west of Shag Rock – outside the Convention Area, because the same stock as in the Shag Rock and South Georgia area may be being exploited.[55] In 1991 there were three reported violations with documentation requirements on Soviet vessels, and fines were imposed.[56] Where non-compliance with conservation measures was reported legal action was often taken by the governments of the flag state of the vessels concerned, but at the CCAMLR Meeting in 1991 it was suggested in an unofficial paper that "in the 1980s an unknown (but possibly large) proportion of violations with respect to finfishing and incidental mortality may not have been reported to CCAMLR".[57]

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[53] SC-CAMLR-XII, 3.3-3.9, pp.21-22.
[54] CCAMLR-XIV, 4.5, p.8.
[55] SC-CAMLR-IX, 3.61, p.26.
[56] CCAMLR-X, 8.2, p.20.
[57] Karl-Hermann Kock, "Fishing and Conservation in Southern Waters", *Polar Record*, 30 (172), 1994, p.14.

In 1992 some Chilean companies began fishing illegally for Patagonian toothfish.[58] This was initially confined to Chilean waters but spread to adjacent Argentine and CCAMLR waters. As the edge of the continental shelf is located outside of the Argentine EEZ a genuine 'high seas' fishery exists in a limited area. This has been a problem for all attempts by CCAMLR to regulate and manage the toothfish fishery as catch which is declared as being taken from the high seas area falls outside of most CCAMLR conservation measures. The Scientific Committee was concerned at the rapid expansion in Division 58.5.1.[59] Chile experienced difficulty in controlling its flagged vessels: "The intention of Chilean authorities is to intensify the control of this fleet. This control could include no permission for fishing in the Convention Area during the 1993/94 season unless vessels comply with all legal requirements ... However the current Chilean legislation does not allow such legal action."[60] The impact of Chile making greater efforts to regulate its flagged vessels was to increase the number of vessels reflagging to non-CCAMLR member flags.

The overall submission of data from previous fishing seasons was disappointing for the Scientific Committee.[61] Doubts were expressed that all the catches reported from the western and northern grounds were actually taken outside the Convention Area.[62] Unilateral actions by other CCAMLR members also began to occur. In August 1994 the UK declared and began enforcing a 200 mile EEZ around South Georgia and the South Sandwich Islands. In 1994 the Commission approved a SCOI recommendation to express deep concern over the indications of large-scale fishing in contravention of conservation measures in the Convention Area.[63] The Commission also expressed concern over the evidence of fishing by non-member countries in the Convention Area.[64] SCOI encouraged members to make more extensive use of the system of inspection. More active participation with inspections was required in light of the illegal fishing operations.[65] At this stage the issue had not attracted public attention.

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[58] ISOFISH, *Occasional Report No 2: The Chilean Fishing Industry: its Involvement in and Connections to the Illegal, Unreported and Unregulated Exploitation of Patagonian toothfish in the Southern Ocean*, 31 March 1999, p.18. http://www.isofish.org.au/news/reports.htm. (site visited 16 January 2001).
[59] SC-CAMLR-XI, 3.90, p.38.
[60] SC-CAMLR-XII, 3.5, p.21.
[61] SC-CAMLR-XII, 3.14, p.22.
[62] SC-CAMLR-XII, 3.31, p.25.
[63] CCAMLR-XIII, 5.13, p.16.
[64] CCAMLR-XIII, 5.16, p.17.

The second phase of IUU fishing in the Southern Ocean

The second phase of IUU fishing was marked by the involvement of European companies and vessels, and a growing degree of alarm within CCAMLR about the challenge posed to its credibility. The degree of challenge posed by IUU fishing was initially questioned and the response from CCAMLR was neither rapid nor comprehensive. IUU fishing also began to expand beyond the South Atlantic into the Indian Ocean sectors of the Convention Area. There was an increasing availability of information about the growing scale of the problem as estimates of IUU activity were made, and increasing concern from the environmental NGOs about the effectiveness of the CCAMLR regime in achieving its conservation objectives.

During the 1994/95 season UK inspections found one longliner illegally fishing in Subarea 48.3, and ten vessels registered with CCAMLR members presumed to be infringing conservation measures were sighted in the same area.[66] In 1995 Norwegian operators become involved in IUU fishing.[67] "SCOI noted with deep concern that the reported sightings indicated that a high level of illegal fishing activity was taking place in Subarea 48.3. Some delegates said that the credibility of CCAMLR was at stake and it faced a considerable challenge in bringing this illegal fishing under control."[68] 1995 was the first time that WG-FSA made estimates for the unreported catch in the Convention Area and from adjacent banks.[69] For 1994/95 the estimate was 2,870 tonnes of unreported catch for Subarea 48.3.[70]

Reaction to the IUU problem in the 1995 Commission meeting was mixed and unconducive to progress. Norway expressed concern about evidence of increasing illegal fishing in the Convention Area.[71] However, Chile argued that the matter was being taken out of proportion and context, and that while illegal fishing was important, it was not the

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[65] CCAMLR-XIII, Annex 5, 1.29, pp.106-107.
[66] CCAMLR-XIV, Annex 5, 1.15-1.21, pp.121-122.
[67] ISOFISH, op. cit., p.18.
[68] CCAMLR-XIV, Annex 5, 1.37, p.124.
[69] CCAMLR-XIV, 4.16, p.11. "The unreported catch was either of the same order or higher than the reported catch. It was acknowledged that although the estimates of unreported catches had been possible this year, such estimates would not necessarily be possible in the future. Australia pointed out that where similar estimations have been performed in other fisheries the sources of information on unreported catch have often disappeared or become less reliable."
[70] SC-CAMLR-XIV, 4.40, Table 3, p.30.
[71] CCAMLR-XIV, 7.3, p.21.

main problem in the operation of CCAMLR and was being exaggerated.[72] Chile and Argentina felt that the main problem was the simultaneous operation in the Convention Area of two sets of rules – national and those adopted by CCAMLR.[73] An extensive discussion on these matters occurred under 'other business'. Australia, France and the UK opposed some of the points made by Argentina and Chile. The issue was whether or not coastal states should exercise jurisdiction only after the CCAMLR consensus system had failed. Brazil commented that: "Situations of a contentious nature should be seen as striking at the heart of the Antarctic system – a system whose very basis was built on international cooperation. By remaining passive or even condoning such situations, the Commission takes upon itself the responsibility for any serious consequences for the future of the system."[74] Brazil and South Africa emphasised the need to bring differences out into the open where discussion in the spirit of the Convention might overcome obstacles. The result of this was the inclusion of a discussion of the implementation of the objective of the convention for the 1996 meeting. Brazil welcomed this: "Since its establishment, the world has changed, issues and concerns have changed. Antarctica may be frozen, but CCAMLR should not."[75]

This decision to have a discussion was going to have no impact on IUU fishing. ASOC expressed concern about CCAMLR's progress in practice, and the IUCN Observer commented that illegal fishing would threaten CCAMLR's status as a model fisheries agreement.[76] Chile and Argentina both: "expressed their disappointment and concern that some observers had exceeded their role and were interfering in political matters under discussion in the Commission."[77] Chile expressed a reservation about IUCN participation as an observer at the 1996 meeting.[78] Japan noted its belief that information papers from NGOs "should be matters of substance or science and not opinions."[79] Despite the progress that had been made in getting acceptance of environmental NGO participation as observers in the CCAMLR decision-making process, the members still found criticism from the NGOs unwelcome.

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[72] CCAMLR-XIV, 7.8-7.9, p.22.
[73] CCAMLR-XIV, 7.10-7.13, p.23.
[74] CCAMLR-XIV, 7.16, p.24.
[75] CCAMLR-XIV, 15.13, p.75.
[76] CCAMLR-XIV, 11.8-11.9, pp.64-64.
[77] CCAMLR-XIV, 11.11, p.64.
[78] CCAMLR-XIV, 14.2, p.67. The IUCN was however present as an observer at the CCAMLR-XV meeting.

Governments did take legal action against activities that contravened conservation measures. This had the effect of forcing companies and individuals involved to conceal their activities and to move away from patrolled waters. In the 1995/96 season some Chilean longliners had begun poaching in the Indian Ocean.[80] This eastward migration may have included up to fifty vessels. Many of the vessels were reflagged, and Belize, Panama, Vanuatu, and Portugal flagged vessels were believed to be fishing in the Convention Area.[81] Some of the vessels lived a double life, fishing legally for part of the year, and illegally for the other part of the year. Operating in the Indian Ocean made transshipping to refrigerated freighters (or 'reefers') necessary.[82] This occurred at sea, or in ports close to the Indian Ocean. South Africa found four vessels fishing without permission near the Prince Edward Islands.[83] The UK noted that illegal fishing in Subarea 48.3 had decreased and presumed that they had shifted elsewhere.[84] A high level of unreported fishing took place in the previously unfished Subareas 58.6 and 58.7 in 1995/1996.[85]

The Commission noted the considerable interest expressed by fishing companies in fishing for *D. eleginoides*.[86] SCOI indicated the problem of reflagged vessels which originally belonged to a Member of the Commission.[87] The Commission expressed its deep concern about reports of fishing by non-Members.[88] The Chairman was requested to write to governments of flag states involved and "convey a firm message that such activities undermine the effectiveness of the CCAMLR conservation approach and to invite such Flag states to consider joining CCAMLR."[89] ASOC made a major statement in the Commission on IUU, expressing a tone of concern but making no specific proposals.[90]

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[79] CCAMLR-XIV, 14.3, pp.67-68.
[80] ISOFISH, op. cit., p.19.
[81] CCAMLR-XV, Annex 5, 1.53, p.141.
[82] ISOFISH, op. cit., p.52.
[83] CCAMLR-XV, Annex 5, 1.40, p.139.
[84] CCAMLR-XV, Annex 5, 1.46, p.139.
[85] SC-CAMLR-XV, 2.9, p.7. "During 1995/96 a high level of fishing took place in previously unfished Subareas 58.6 and 58.7. The unreported catches in these divisions may have been as large as, or even larger than the total catch declared to CCAMLR."
[86] CCAMLR-XV, 4.4, p.7.
[87] CCAMLR-XV, 7.15, p.25.
[88] CCAMLR-XV, 7.17, p.26.
[89] CCAMLR, *CCAMLR Newsletter*, 18, December, 1996, p.3.
[90] CCAMLR-XV, 11.6, p.74.

The third phase of IUU fishing in the Southern Ocean

If the developments in 1995 and 1996 were a shock to the CCAMLR regime, then the years from 1997 to 2000 have seen a sustained impact that has not abated. This third phase of IUU fishing has seen a continued expansion of both regulated and unregulated fishing. The issue has also gained the attention of the ATCPs at ATCMs. Public concern has grown with the IUU fishing being widely reported in the media. The time taken up by the IUU issue at CCAMLR meetings has grown and occupied much of the attention of the Commission.

In 1997 the XXI ATCM was held in Christchurch, New Zealand. The local press carried many articles in relation to IUU fishing. The issue was raised in the speeches of the New Zealand Ministers Simon Upton, and Jim Bolger, and discussed in the margins of the ATCM.[91] Information was exchanged between the concerned parties[92] and referred back to CCAMLR. At the time of the ATCM rumours circulated of a Chinese fishing fleet, estimated at 200 vessels, under construction by Chinese companies that would operate in the Convention Area.[93] This was a cause of concern because although China was an ATCP, it was not a member of CCAMLR.

At the 1997 Commission meeting the IUU issue was an agenda item in its own right and attracted attention in the opening statements of the meeting. The Chairman noted that "[CCAMLR] conservation measures were exemplary and its pioneering precautionary approach had become a model for other organisations. Unfortunately ... these progressive measures had little effect if they were not effectively implemented."[94] His Excellency the Honourable Sir Guy Green, Governor of Tasmania "believed that it was necessary for the Commission to resolve this problem in order not only to ensure the effectiveness of the

[91] "some delegations (notably Germany and Japan) fussed about the propriety of discussing CCAMLR matters in Christchurch" in "Toothfish Plunder Threatens Southern Oceans", *Antarctic: The Journal of the New Zealand Antarctic Society*, 15 (2), 1997, p.30. Several nations went as far as actually veto the discussion. "Pirate Fisherman Debate Vetoed at Antarctic Meeting", *The Gisborne Herald*, Saturday, May 31, 1997.
[92] *Antarctic Treaty Consultative Meeting: ATCM XXI, Christchurch, New Zealand, 19-30 May 1997, New Zealand Delegation Report*, Antarctic Policy Unit: Ministry of Foreign Affairs and Trade, p.24.
[93] "China Talks on Antarctic Pact", *Evening Post*, Wellington, 31 May 1997.
[94] CCAMLR-XVI, 1.2-1.3, p.1.

Convention but also to maintain the organisation's prestige and credibility in the wider communities of the world."[95]

More information was available to the meeting about the scale of the problem. The total reported catch of toothfish from EEZ outside the CCAMLR Convention Area, and from inside the CCAMLR Convention Area, was 32,991 tonnes. The unreported catch derived from landings in ports of southern Africa and Mauritius was estimated to be 74,000 to 82,200 tonnes. The total catch was estimated to be 107,000 to 115,000 tonnes, with around 130,000 tonnes of toothfish available on the world market.[96] Australia estimated the total wholesale value of the IUU catch of toothfish to be in the order of half a billion Australian dollars, and that it was likely that over 100 vessels were involved in the illegal fishing activities.[97]

Individual members of the Commission made extensive statements about the problem. These extensive statements are unusual in CCAMLR documents, and are some of the lengthiest political statements made in the CCAMLR Commission Report after the problems of the Scientific Committee's relationship in the late 1980s. Norway expressed its concern that: "Overfishing, illegal, unregulated and unreported at this moment constitutes a most serious challenge to the reputation and credibility of CCAMLR as an intergovernmental organisation for rational management of living marine resources on a sustainable basis."[98] The European Community stated that: "The progress accomplished by the organisation over the last fifteen years is consequently at risk, not only of being undermined, but irreparably damaged by these activities."[99] Australia had committed itself to expensive national action by apprehending vessels caught in the Australian EEZ around the Heard and McDonald Islands but pointed out "that such action can result in the displacement of illegal fishing to other CCAMLR areas and that the combating of illegal fishing can only be fully effective through the action and cooperation of all Members."[100] The UK welcomed the various conservation measures "but their effectiveness will depend upon the good faith of each Member to implement them in full."[101] New Zealand

[95] CCAMLR-XVI, 1.10, p.1.
[96] CCAMLR-XVI, 4.10, p.5.
[97] CCAMLR-XVI, 5.31, p.12.
[98] CCAMLR-XVI, 5.5, p.9.
[99] CCAMLR-XVI, 5.2, p.8.
[100] CCAMLR-XVI, 5.30, p.12.
[101] CCAMLR-XVI, 5.28, p.11.

commented "that CCAMLR faced the most serious challenge in its existence ... It noted there was a lot of other information available which added further detail to the picture by naming companies and individuals behind these operations. New Zealand knew who they were – but the information could not be tabled at the Commission."[102] New Zealand also observed that "State Parties could ensure that no vessels flying their flags were involved in the toothfish fishery – but the stocks could still be cleaned out by non-Contracting Party vessels."[103] The CCAMLR members generally agreed that:

(i) the evidence of large-scale illegal, unreported and unregulated fishing in the Convention Area advised by CCAMLR Members during 1996/97 and in the beginning of the 1997/98 season, has seriously undermined the work of CCAMLR on achieving the Convention's objective;

(ii) the extent of existing illegal, unreported and unregulated fishing poses a serious threat to the conservation of stocks of *Dissostichus* spp. in the immediate future and also to the survival of several species of seabirds in the Southern Ocean taken as incidental by-catch in longline fishing operations.

(iii) not only vessels of non-Contracting Parties to CCAMLR but also vessels of CCAMLR Contracting Parties were reported fishing in the Convention Area contrary to the CCAMLR conservation measures in force;

(iv) all information received points to a blatant disregard by non-Contracting Parties of the CCAMLR conservation regime and of the sovereign rights of Coastal States in the Convention Area; and

(v) the situation calls for collective efforts within CCAMLR, measures by Flag States and Coastal States and steps vis-a-vis non-Contracting Parties to enhance enforcement and compliance with conservation measures regarding living resources in the Convention Area.[104]

In 1998 the ATCM held in Tromsø agreed that concerted action was needed to support the Convention in matters of IUU fishing in the CCAMLR Convention Area.[105] At the Commission meeting the UK pointed out that CCAMLR: "being not only a fisheries organisation but also an environmental organisation, has a crucially important role within the Antarctic Treaty System. Any weakness in the operation of CCAMLR reflects on the Antarctic Treaty System as a whole."[106] The Chairman noted that "the conservation measures adopted each year are exemplary, but that these measures will have little impact

[102] CCAMLR-XVI, 5.12, p.9.
[103] CCAMLR-XVI, 5.14, p.10.
[104] CCAMLR-XVI, 5.22, pp.10-11.
[105] CCAMLR-XVII, 11.1, p.80.

if they are not effectively controlled and implemented."[107] The Governor of Tasmania "paid tribute to the way in which the Commission had converted that part of the Antarctic Treaty System with which it was concerned into an effective regime supported by equally effective institutional arrangements."[108]

Namibia and Mauritius accepted the invitation to attend CCAMLR-XVII. This prompted some discussion about how such third-party observers should be handled, necessitating some minor changes to the rules of procedure.[109] "There was general agreement that invited observers had made a significant contribution to the meetings of CCAMLR, and that their participation enhanced the transparency of CCAMLR's decision-making process."[110] Australia was concerned by the proposal that the Commission resile from the invitations issued at CCAMLR-XVI, and "considered that any erosion of the openness and transparency of the Commission would diminish the strength of the Commission and its close relations with a wide range of observers."[111] Namibia explained its position, how it had only gained independence in 1990 and had experienced massive problems with illegal fishing by foreign fleets in its EEZ. The Namibian government was working to amend its Sea Fisheries Act in order to conform to UNIA and the FAO Compliance Agreement. Namibia was opposed to the undermining of CCAMLR management measures.[112]

In 1998 there appeared to be a downturn in the scale of IUU fishing in the Convention Area for the 1997/98 season. This may have been due to a combination of market forces, enforcement by CCAMLR Members, and a decrease in catch rates.[113] The total catch of reported finfish from the Convention Area in 1997/98 was 11,419 tonnes. *D. eleginoides* accounted for 11,168 tonnes of this catch. The total reported catch of *D. eleginoides* from CCAMLR waters and EEZs outside the CCAMLR Convention Area was 27,908 tonnes. However the estimated unreported catch was 22,415 tonnes.[114] "The Scientific Committee noted that about 90% of *D. eleginoides* was exported to Japan and the US, and that at least 60 518 tonnes of *D. eleginoides* were traded in the 1997/98 split-year. Less than 50% of

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[106] CCAMLR-XVII, 11.2, p.81
[107] CCAMLR-XVII, 1.2, p.1.
[108] CCAMLR-XVII, 1.10, p.1.
[109] CCAMLR-XVII, 2.2-2.6, p.2. The Japanese appear to have been concerned about the presence of observers like ASOC at SCOI and SCAF, see CCAMLR-XVII, 2.16, p.3.
[110] CCAMLR-XVII, 2.7, p.3.
[111] CCAMLR-XVII, 2.11, p.3.
[112] CCAMLR-XVII, 2.20, pp.3-4.
[113] CCAMLR-XVII, Annex 5, 2.3, p.3.

this trade could be attributed to reported catches from CCAMLR waters and EEZs outside the Convention Area."[115] Forty-five sightings of fishing vessels of non-Contracting Parties were made in 1997/98, some of the vessels being flagged to Seychelles, the Faroe Islands, and Belize.[116] The South African vessel *Sudar Havid* sank 6 June 1998, there were twenty-one survivors, including a UK scientific observer, and seventeen dead.[117]

The 1998 meeting was addressed on behalf of Australia by Senator, the Honourable Robert Hill, the Australian Minister for the Environment and Heritage.[118] Senator Hill stressed the need for action to stop IUU fishing and urged the adoption of a range of effective measures to combat these illegal activities, including a catch certification scheme, and other trade related measures. "A failure to act on such proposals would mean that CCAMLR would be failing in its primary objective of conserving Antarctic marine living resources. It would also undermine the credibility of CCAMLR as an effective international organisation."[119]

The Scientific Committee recommended that the Commission take the most stringent measures possible to combat IUU in the Convention Area. This recommendation was based on the conclusions that:

(i) there is a distinct possibility that stocks of *D. eleginoides* will continue to be depleted to extremely low levels;

(ii) the long-term yield of the targeted stocks of *D. eleginoides* is likely to be compromised in the future by ineffective control of illegal, unregulated and unreported fishing; and

(iii) the potential levels of incidental mortality of several species of seabirds in longline fisheries were found to be unsustainable for the populations of these species.[120]

Extensive statements were again made in reaction to the IUU problem by the EC, Norway, New Zealand, Chile, and South Africa. The EC acknowledged the challenge and suggested

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[114] CCAMLR-XVII, 4.7, p.8.
[115] CCAMLR-XVII, 4.8, p.8.
[116] CCAMLR-XVII, 5.4, p.13.
[117] CCAMLR-XVII, 2.23, p.4. Charl de Villiers, "South African Inquiry into Sinking of Toothfish Longliner", 22 August 1998, http://www.isofish.org.au/news/98/news.22aug98.sudurhavid.SA.htm (site visited 27 March 2001).
[118] This ministerial presence was a rare event for CCAMLR, and occurred notably on Melbourne Cup Day.
[119] CCAMLR-XVII, 5.3, p.13.
[120] CCAMLR-XVII, 5.5, p.13.

that separate but inter-related measures were needed.[121] The Norwegian statement addressed similar concerns but also highlighted the potential limits to what could be expected from CCAMLR:

> In discussing new efficient measures and ways and means of their enforcement we are approaching complex questions of international law, the sacrosanct Flag-State principle and the principle of not giving laws extra-territorial application. These principles have ... been pillars of marine resource management both in CCAMLR and other international marine management organisations. In the Norwegian view, the Flag-State principle – i.e. that the responsibility resides with the Flag State – should continue as the basis of regulatory measures.[122]

New Zealand compared IUU fishing: "to a cancer eating at the fibre of the Antarctic Treaty System."[123] New Zealand observed that IUU fishing was being conducted mainly by companies and individuals originating from CCAMLR parties and that this was legal in the jurisdiction of such companies. The vessels involved appear to be flying third-party flags. Concerned that IUU fishing would move into the Ross Sea in the next summer season. New Zealand was wary of increasing the compliance costs of the legal fishing operators. "Until and unless CCAMLR Parties were prepared to take effective action against nationals and companies, the rest of the world would fail to see CCAMLR as an effective conservation regime."[124]

It was becoming obvious that existing conservation measures were inadequate. According to Chile: "despite the existence of more stringent conservation measures the levels of unregulated fishing continue to challenge the feasibility of the objectives of the Convention."[125] South Africa noted that the "strong measures announced by South Africa at the Sixteenth Meeting, some of which were criticised for going too far, turned out not to have gone far enough."[126] The United States view was that it was "time to move from reiterating the seriousness of the problem to dealing with it."[127] The members were aware that it was difficult to expect that non-contracting parties would assist CCAMLR while CCAMLR members have not exerted the greatest possible efforts themselves. Most members were wary about adopting measures that might undermine the flag state principle,

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[121] CCAMLR-XVII, 5.7, p.13.
[122] CCAMLR-XVII, 5.8, p.14.
[123] CCAMLR-XVII, 5.9, p.15.
[124] ibid.
[125] CCAMLR-XVII, 5.10, p.15.
[126] CCAMLR-XVII, 5.11, p.16.
[127] CCAMLR-XVII, 5.13, p.16.

remaining cautious in dealing with extra-territoriality issues, and wanted any trade-related measures to be in conformity with General Agreement on Tariffs and Trade (GATT) and World Trade Organization (WTO) rules.

In 1998 applications continued to be made to start new toothfish fisheries despite the IUU fishing problem. Australia applied for an exploratory trawl fishery in Divisions 58.4.1 and 58.4.3. New Zealand applied for an exploratory longline fishery in Subarea 88.1. South Africa applied for a new longline fishery in Subarea 48.6 and Division 58.4.4 and exploratory fisheries in Subareas 58.6 and 58.7. Spain applied for an exploratory longline fishery in Division 58.4.4, and Uruguay applied for an new longline fishery in 58.4.4.[128] Applications submitted after deadlines had passed were still a problem and the Commission stated that applications for new and exploratory fisheries had to be submitted on time to be fully evaluated.[129] The Scientific Committee was unable to provide estimates for mixed-gear fisheries (where longline and trawl techniques are both used) for 1998/99.[130] The United states expressed concern over the development of fisheries targeting Antarctic toothfish. Very little was known about the species and it was one of the few target species which occurred entirely within the Convention Area.[131]

A serious problem at the 1998 CCAMLR meeting was a breach of confidentiality. This was potentially a great setback for the environmental NGOs and for the transparency of CCAMLR.

> It came to the attention of the Commission that ISOFISH had recently placed on its website information which reported proceedings of a meeting of SCOI to which no observers from international organisations were invited. This action was in a clear breach of confidentiality of discussions held by SCOI.[132]

CCAMLR received a letter of apology from ASOC and an assurance that such actions would not recur. The delegation of Uruguay was upset because the leaked information wrongly affirmed that an offending vessel was flying a Uruguay flag.[133] Norway warned that NGOs should not give the impression of representing CCAMLR.[134] Japan sought

[128] CCAMLR-XVII, 7.5-7.11, p.30.
[129] CCAMLR-XVII, 7.13-1.15, p.30.
[130] CCAMLR-XVII, 7.16, p.30.
[131] CCAMLR-XVII, 7.21, p.31.
[132] CCAMLR-XVII, 12.25, p.85.
[133] CCAMLR-XVII, 12.26-12.27, p.85.
[134] CCAMLR-XVII, 12.28, p.85.

resolution on the importance of maintaining confidentiality, but this was blocked by other members who felt it was inappropriate: "The Commission confirmed that while transparency in its operation is important, especially for the involvement of non-Member States and intergovernmental organisations, the Members continue to take seriously their responsibilities with respect to confidentiality."[135] Without confidentiality commercial data will not be forthcoming, and without commercial data CCAMLR is unlikely to be effective. The rules of procedure were amended so that while observers could be restricted from attending sessions attended by the Members, they could also be invited.[136]

New Zealand hosted a 'Ministerial on Ice' from 25-28 January 1999 with representatives from twenty-three ATCPs meeting informally at Ross Island, Antarctica. Simon Upton, New Zealand Associate Minister of Foreign Affairs and Trade, made a statement about the Toothfish saga and how it threatened the credibility and integrity of the ATS: "The fact that this fishing may be made 'legal' through the use of flags of convenience or elaborate company arrangements does not make it morally right."[137] A Ministerial Communiqué was issued which demonstrated the development of political will to solve problems:

> The Antarctic Treaty System is facing new challenges, including pressures from non-sustainable use of resources. Representatives expressed in particular their grave concern at the threat posed by continuing illegal, unregulated and unreported fishing for toothfish. Representatives pledged themselves to work to meet these new challenges and to maintain the integrity of the Antarctic Treaty System.[138]

This kind of statement would have been difficult to make at an ATCM, where the agenda is already crowded and because some ATCPs would rather leave the issue to CCAMLR.

New Zealand also dispatched *HMNZS Te Kaha* to the Ross Sea, a patrol effort that is illustrative of the difficulties of enforcement in the Southern Ocean. A robust display of sovereignty, but it only just got to 60° South latitude at the edge of the fishing grounds. *HMNZS Te Kaha* patrolled 60-64° South latitude, encountering waves of 14 metres, wind speeds of 50-60 knots/90-110 kmh, with peaks of 20m and 75 knots/139 kmh.[139] Anchor

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[135] CCAMLR-XVII, 16.5, p.90.
[136] CCAMLR-XVII, 16.1-16.2, p.90.
[137] Tim Higham, Rachel Scott, Antarctica New Zealand, et al. Foundation, *Ministerial On Ice: An Historic Meeting*, Antarctica New Zealand: Christchurch, 1999, p.14.
[138] ibid., p.53.
[139] Bill Hopper, "Navy in Defence of the Toothfish", *Antarctic: The Journal of the New Zealand Antarctic Society*, 17 (1), 1998-99, p.7 and p.24.

machinery was swept away, and a hole in the deck created by rogue 20-meter waves.[140] Airborne P3 Orions were also patrolling between 60 and 74° South latitude. From 60-65° South latitude they are able to spend five hours on station, at 70° South latitude three hours on station, and at 74° South latitude just one hour.[141] Although it was difficult to tell whether any IUU fishing occurred in the Ross Sea, New Zealand had grounds for its efforts. According to Stuart Prior: "We had credible information about groups of pirate vessels looking at heading into the Ross Sea and we also had information from fishing industry sources which suggested that people were already confident enough to be offering Ross Sea toothfish for sale and seeking buyers on the European market."[142] Although many rumours circulated that boats were preparing to make the trip, neither the legal fishers nor the maritime surveillance found anything definite, just some lines of floats.[143] Access to the Ross Sea is very difficult due to the ice conditions, and legal fishing vessels rely on an informal agreement with Italian icebreakers. Because of the high seas status of the area patrolled, the approach taken differed from EEZ patrols, where the Royal New Zealand Navy attempts to surprise IUU fishers and arrest them. Instead, they aimed for the maximum deterrent effect by publicising the patrols widely. In the event of IUU fishing being discovered, the response would have been to take photographs and distribute them immediately through the international media.[144]

In April 2000, growing world attention was highlighted when ISOFISH activities featured strongly in a joint TVE, UNEP, and WWF television news video called 'White Gold'. Among other things, this showed how ISOFISH had helped facilitate cooperation between Greenpeace and the French Navy. At the start of CCAMLR-XVIII, the Governor of Tasmania suggested that: "the Commission should feel encouraged by the knowledge that what it is doing was fundamentally right and sensible, and that its endeavours had substantial popular support."[145] The Chairman noted that it was an important meeting, with complex issues to be resolved, with "a broad range of expectations, not only from within the organisation but also from outside: from the media, from non-governmental organisations and from individuals concerned with the living resources of Antarctica."[146]

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[140] Judith Martin, "High Seas Hunter", *New Zealand Defence Quarterly*, Winter, 1999, pp.9-10.
[141] Bill Hopper, op. cit., p.7.
[142] ibid.
[143] "Joint Venture Taps Prized Fishery", *The Press*, Christchurch, 4 March 1999, p.1.
[144] Bill Hopper, op. cit., p.24.
[145] CCAMLR-XVIII, 1.10, p.1.
[146] CCAMLR-XVIII, 2.1, p.2.

The total reported catch of finfish from the Convention Area in 1998/99 was 18,006 tonnes, of which *D. eleginoides* accounted for 17,435 tonnes.[147] Despite the measures adopted in 1997 and 1998, IUU fishing continued. Members reported sightings of sixteen vessels in the Convention Area, with three vessels flags being identified: Argentina, Belize, and Panama. France reported that four vessels, two from Chile, and one each from Argentina and Belize, found engaged in IUU fishing in the Kerguélen EEZ were subject to legal and administrative action, and another two had been sighted.[148] The IUU fishing effort appeared to be concentrated in the Indian Ocean in Area 58. The estimated IUU catch in 1998/99 was 10,773 tonnes, but the "Scientific Committee also advised that although estimates of IUU *Dissostichus* spp. catches have decreased ... the difficulties in estimating such catches have increased."[149]

Fishing took place in only one of the new and four of the exploratory fisheries in 1998/99 season.[150] There was still a paucity of fishery information on toothfish in a number of subareas and divisions, something of concern given the substantial IUU fishing believed to have occurred in these areas.[151] Serious difficulties were encountered in trying to calculate precautionary catch levels that took account of the potential impact of IUU fishing, with calculated yield levels far in excess of possible precautionary catch levels. This was taken to indicate that the methods should not be used for *Dissostichus* spp. while information on stock status and recruitment was absent.[152] The Commission agreed that with the high level of IUU fishing, it was unrealistic to regard fisheries for *Dissostichus* spp. as new, and all the 1999/2000 toothfish fisheries would be considered exploratory. There was a need to conduct fisheries-independent surveys to estimate recruitment.[153]

New Zealand referred to the focussing of world attention on illegal fishing in the Southern Ocean and noted that "information had been received which indicated that vessels flagged by Contracting Parties may be involved in illegal fishing. In other cases, New Zealand noted that nationals and companies from Contracting Parties were involved and using 'flag

[147] CCAMLR-XVIII, 4.5, p.7.
[148] CCAMLR-XVIII, 5.2, p.11.
[149] CCAMLR-XVIII, 5.4, p.12.
[150] CCAMLR-XVIII, 7.1, p.24.
[151] CCAMLR-XVIII, 7.2, p.24.
[152] CCAMLR-XVIII, 7.10-7.12, p.26.
[153] CCAMLR-XVIII, 7.15, pp.26-27. Plan further elaborated in 7.18-7.21, pp.27-28.

state responsibility' as a shield. This was unacceptable."[154] CCAMLR was not just a fisheries agency. The ATS had to be responsible to the wider concerns of civil society. South Africa commented on how the high levels of IUU fishing in the Indian Ocean have caused permanent damage, with catch rates around the Prince Edward Islands falling to 10% of their initial levels, which "bears testimony to CCAMLR's collective inability to effectively address this serious problem, both as individual States and as a Commission .... The Commission's best effort may in retrospect appear to be a case of too little too late."[155]

South Africa believed that there were new trends in IUU fishing, such as transhipment at sea, new landing sites in Mozambican ports, and growing exports to new markets in non-Contracting Parties such as China.[156] More could be done to identify fishing vessels. Brazil felt that the Commission "should take care not to be seen as an organisation which accepts IUU fishing by a few countries while others look on passively. It is high time that fishing states and importing nations assume their responsibilities".[157] Chile commented that: "assuming that the illegal fishery may be seen as the main challenge to the objective of the Convention, some inherent weakness in the CCAMLR system had allowed such a challenge to develop. But even if the IUU was finally defeated, implementation of the objective could remain an unfinished task."[158]

The development of an action plan to enhance cooperation between CCAMLR and non-Contracting Parties and ensure the effectiveness of conservation measures was discussed.[159] This would encourage non-Contracting Parties to attend as observers, and to accede to the Convention. Information about the Catch Documentation Scheme (CDS) was to be provided along with a request for participation. Help was also to be requested for dealing with flag vessels in the Convention Area.[160] Namibia and Vanuatu were planning to accede to the Convention and Namibia intended to apply for membership of the Commission.[161] The observer from Denmark explained that while the Faroe Islands was

[154] CCAMLR-XVIII, 5.17, p.14.
[155] CCAMLR-XVIII, 5.19, p.16.
[156] ibid.
[157] CCAMLR-XVIII, 5.20. p.17.
[158] CCAMLR-XVIII, 13.8, p.54.
[159] CCAMLR-XVIII, 5.49-5.50, p.21.
[160] CCAMLR-XVIII, Annex 8, pp.175-176.
[161] CCAMLR-XVIII, 2.4, p.2, and 2.8-2.9, p.3.

not in a position to consider membership of CCAMLR, they were ready to fully respect the principles laid down in the Convention.[162]

The IUCN Observer made several comments: both effective port control and trade measures are required; non-Contracting Parties should be encouraged to accede to CCAMLR; regional tuna commissions should be encouraged to investigate seabird by-catch in longline fisheries; adopt national plans in support of the FAO IPOA for Seabirds; support the nomination of seven at-risk species of petrel to Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES); and consider the adoption of Marine Protected Areas (MPAs).[163] The ASOC observer signalled a significant change in the stance taken by ASOC: "ASOC considered that the creation of a sufficiently severe enforcement regime is urgently required. It believed, reluctantly, that a crucial step towards ending IUU fishing is for CCAMLR to place a moratorium on legal fisheries for *Dissostichus* spp."[164] This would require concomitant sanctions under CITES. A moratorium should be maintained until all IUU fishing has been eliminated, all *Dissostichus* spp. stock parameters are available, a trade system for the verification of catch origin is in place and incidental seabird catch is eliminated.[165] The Republic of Korea did not believe that further interaction with CITES would be appropriate.[166]

Interaction with other organisations was increasingly prevalent and important and needed to be considered further. Of these organisations, the most important one in organising attempts to deal with the problems posed by IUU fishing has been the FAO. There was a meeting of FAO and non-FAO Regional Fisheries Bodies in Rome, Italy, in February 1999, at which CCAMLR was represented by Italy. Several important conclusions were reached regarding the use of 'flags of convenience' and the application of the ecosystem approach to management.[167] The meeting agreed that FAO should act as a communication channel among regional fisheries bodies.[168]

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[162] CCAMLR-XVIII, 2.10, p.3.
[163] CCAMLR-XVIII. 12.2, pp.46-47.
[164] CCAMLR-XVIII, 12.3, p.47.
[165]
[166] CCAMLR-XVIII, 13.10, p.54.
[167] FAO, Report of the Meeting of FAO and Non-FAO Regional Fishery Bodies or Arrangements. Rome, 11-12 February 1999. *FAO Fisheries Report*. No.597. Rome, FAO, 1999. "In particular, it stressed the importance of the precautionary approach for fisheries management and governance and of involving all stakeholders in developing management measures, and urged to continue to adapt their mandates, structures and policies in order to respond better to the challenges facing world fisheries. It expressed its concern over the problems arising from over-capacity in fisheries and the lack of sufficient progress in improving the

The CDS entered into effect in May 2000, and was generally welcomed. One significant problem in its implementation was that China initially refused to participate. While an ATCP, China is not a member of CCAMLR, and is not therefore required to participate.[169] ISOFISH believed that IUU fish was now being imported into Japan from China, although Mauritius still remained the largest source.[170] France has been putting pressure on Mauritius to take stronger action.[171] It is interesting to note that despite Mauritius being involved with CCAMLR since 1998, IUU activities could continue to be based in and operate out of Port Louis. On October 10, 2000, the FV *Amur* sank in the French EEZ off the Kerguélen Islands with the loss of fourteen lives.[172] This may have spurred Mauritius to greater cooperation against IUU activities.[173] Attempts were made to pressure Mauritius to conform with CCAMLR,[174] and in 2000 Mauritius agreed to cooperate with the CDS.[175]

In the ASOC report to CCAMLR XIX, concerns were expressed about the CDS: "we are concerned that its structual limitations, and incomplete implementation, especially by

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monitoring and enforcement of management measures.", http://www.fao.org/fi/meetings/rfb/r597e.asp, (site visited 27 March, 2001).

[168] CCAMLR-XVIII, 12.5, p.47.

[169] The Antarctica Project, "China Opens Ports to Pirate Fishers", Washington DC, 28 June 2000. http://www.asoc.org/currentpress/0628pr.htm (site visited 27 March 2001). In 2000 China was invited to attend the CCAMLR-XIX meeting as an observer because of its interest in the toothfish trade, but did not attend. A further invitation was extended for 2001. CCAMLR-XIX, 1.6, p.5, and 16.3, p.73. In 2001 China confirmed its involvement in the scheme, http://www.traffic.org/toothfish/tooth3.html, (site visited 11 February, 2002).

[170] ISOFISH, "Japanese Toothfish Import Data Reveal Trade Routes for Stolen Fish", September 2000, http://www.isofish.org.au/news/index.htm (site visited 27 March 2001).

[171] ISOFISH, "France Forces Mauritius Authorities to Stop Toothfish Poachers Unloading in Port Louis" August 2000, and "Local Toothfish Traders Allowed to Keep Handling Pirated Toothfish" 28 July 2000, http://www.isofish.org.au/news/index.htm (site visited 27 March 2001).

[172] *ECO*, 2, 26 October 2000, CCAMLR-XIX, Hobart Tasmania, http://www.asoc.org/ECO2.htm (site visited 27 March 2001). Although flagged to Sao Tome, the *Amur* was probably connected to Spanish fishing interests. Two vessels (the *Grand Prince* and the *Abriza I*) involved with the rescue of survivors refused to cooperate with the French rescue effort and fled the scene. *ECO*, 3, 30 October 2000, CCAMLR-XIX, Hobart Tasmania, http://www.asoc.org/eco3.htm (site visited 27 March 2001). Working conditions on vessels involved in IUU fishing are often substandard and can involve the exploitation of crews from developing countries. The International Transportworkers Federation has a campaign against flag of convenience vessels for this reason. See ITF Fisheries, *Troubled Waters: Fishing, Pollution, and FOCs*, http://www.itf.org.uk/SECTIONS/fisheries/troubledwaters/twindex.htm (site visited 19 March, 2001).

[173] "Joint Statement by Senator Robert Hill, Minister for the Environment and Heritage Hon Warren Truss, Minister for Agriculture and Fisheries", 2 November 2000, http://www.environment.gov.au/minister/env/2000/mr2nov200.html (site visited 27 March 2001).

[174] The UK threatened to close markets, while France offered to resolve a sovereignty dispute. Personal notes, Alistair Graham Lecture, 22 June 2000.

[175] "Mauritius Adopts Catch Documentation Scheme", 12 November 2000, http://www.isofish.org.au/news/index.htm (site visited 16 January, 2001).

CCAMLR Parties, has limited its ability to stop the trade of IUU toothfish."[176] ASOC believed that commercial interests had negated the CCAMLR approach and that the IUU catch still exceeded the legal catch. Calls were repeated for a moratorium until IUU fishing could be brought under control and the stocks assessed. ASOC made it clear that there would be renewed pressure for a CITES listing at the next CITES meeting in 2002. ASOC made a number of suggestions: increased use of vessels and aircraft in the Convention Area needs to be made, as well as the use satellites. Krill vessels require VMS and observers, because the fishery has the potential to expand rapidly. ASOC argued that if CCAMLR is unable to bring IUU fishing under control then: "it may be time to place management of fisheries in other parts of the Antarctic Treaty System – before the entire ATS is irredeemably damaged by the failure."[177] If CCAMLR fails it also undermines the Madrid Protocol, and the political compromises that led to that agreement. A statement similar to the one given at CCAMLR-XVIII was made:

> "At the beginning of the Century, 21 years on from the establishment of the management regime that was supposed to safeguard the Antarctic marine ecosystem, commercial greed, political weakness and institutional ineptitude present us with the same old situation – chronic and essentially unregulated overfishing of target species, and massive incidental catch of other species".[178]

Why did IUU fishing occur?

IUU fishing occurred in the Southern Ocean due to a variety of factors: economic incentives encouraged it; technically it was feasible; and many individuals and companies were willing to take the risks. While there has been money to be made with little fear of detection, the 'bad actors' have had little reason not to engage in IUU fishing. Operating in the Southern Ocean is difficult and expensive. A modern large, long-range, refrigerated, self-contained fishing vessel can cost $A10-30 million, with daily operating costs of $A20,000-40,000.[179] The fact that toothfish could be harvested in large quantities, combined with its ability to be substituted into existing high-value fish markets meant that significant profits could be made. IUU fishing started against a backdrop of growing global

[176] Report of the Antarctic and Southern Ocean Coalition (ASOC) to the XIX Meeting of the Convention on the Conservation of Antarctic Marine Living Resources, Hobart, 2000.http://www.asoc.org/ASOCreport.htm (site visited 27 March 2001).
[177] ibid.
[178] ibid.

demand for marine protein, and an existing over-capacity in the fleets that harvest that potential.[180] In the Southern Ocean there was initial access to an undeveloped toothfish fishery in Argentine waters with no quota limits, followed by abundant and locatable stocks around Sub-Antarctic islands. There was an appreciation of the low risk of apprehension because of weak coastal state controls in these distant waters, and the low financial costs of apprehension because of the use of older 'rust bucket' vessels which cost little to write off. Improving control over home waters and increasing associated costs of compliance with regulations also favoured fishing in the high seas.[181]

IUU occurred in part because it was possible for it to occur. In a technical sense, evading CCAMLR requirements was not exceptionally difficult in the early 1990s. It was, and remains, a relatively simple task to reflag a vessel, to establish shelf companies, and perform other tricks that obscure the legal trail.[182] A few phone calls are all it takes for an established operator to acquire a vessel and establish a shelf company.[183] The penalties for being caught involved in IUU fishing are largely financial. Jail terms are uncommon,[184] although there may be some loss of freedom while waiting for court cases to be resolved. Fishers are willing to take that kind of risk and the phenomenon of 'captains of convenience', people employed to take responsibility for a boat engaged in IUU fishing, has been encountered.[185] Ultimately, the individuals and companies that have enjoyed the greatest profits from IUU fishing have borne very little risk.

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[179] Martin Exel, "Exploitation of Southern Ocean Fisheries: An Industry Perspective", in Bateman, Sam., and Donald R. Rothwell, editors, *Southern Ocean Fishing: Policy Challenges for Australia*, Wollongong Paper on Maritime Policy No. 7, Centre for Maritime Policy, University of Wollongong: Wollongong, 1998, p.105.
[180] ISOFISH, *Occasional Report No 2: The Chilean Fishing Industry: its Involvement in and Connections to the Illegal, Unreported and Unregulated Exploitation of Patagonian toothfish in the Southern Ocean*, 31 March 1999, p.18. http://www.isofish.org.au/news/reports.htm. (site visited 16 January 2001), p.20.
[181] Martin Exel, op. cit., p.108. The cost of complying with government regulations has an effect on the economics of being involved in the fishery.
[182] The ISOFISH organisation has spent considerable effort in tracking attempts by IUU fishing operators to conceal ownership of vessels. See ISOFISH, *Occasional Report No 4: Using the Lloyds Register of Shipping to Track Toothfish Poachers Changing Vessel Names in an Attempt to Avoid Identification by the CCAMLR Catch Documentation Scheme*, May 2000, http://www.isofish.org.au/news/reports.htm.
[183] Personal notes, Alistair Graham Lecture, 22 June 2000.
[184] ibid.

Who is involved in IUU fishing?

Identifying those involved in IUU fishing in the Southern Ocean is difficult. Governments are hampered by the requirement of having to work to an evidential standard. NGOs are less restricted, but have to be careful to avoid defamation, or the opprobrium that goes with 'crying wolf'.[186] Information about who is responsible for IUU fishing is difficult to extract from CCAMLR. While it is acknowledged that a major part of the IUU problem is caused by nationals and companies of CCAMLR members, the exact nationalities responsible are not identified in CCAMLR publications. ISOFISH has not shown that reluctance and in a series of reports has detailed the companies and individuals involved in IUU fishing. The labelling of IUU operators by the NGOs does not rest comfortably with CCAMLR members and in 1998 Chile, Norway, Japan, and Argentina expressed an opinion about background papers provided by ASOC that although they contained information relevant to CCAMLR, "the language used in these papers is often inappropriate and should be avoided in communications between governmental and non-governmental organisations."[187]

ISOFISH called the Norwegian companies and individuals involved 'vikings', identifying three principle groups: Magne Hisdal and the Glacial group, Oddvar Vea and the Cindy Fishing Co.; and Jan Sjaastad and Norse Seafood Ltd.[188] Denmark's autonomous region, the Faeroe Islands, was also suspected by ISOFISH of being involved with the 'vikings'. In Chile ISOFISH identified Roberto Verdugo, a former Under-Secretary of Fisheries for an earlier Chilean government, as the 'pirate king' controlling the Verdugo group of companies.[189] The 'spanish armada' is the term used for "a host of Spanish, Chilean and

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[185] ISOFISH, op. cit., p.60. "It is said that, customarily, on the Spanish vessels, effective control of fishing operations rests with the fishing master, who is usually Spanish, not the skipper, who is usually Argentinian or Chilean."

[186] ISOFISH has made at least one apology for an incorrect identification in *Occasional Report No 1: The Involvement of Mauritius in Patagonian Toothfish from Illegal and Unregulated Longline Fishing in the Southern Ocean, and What Might be Done About it*, August 1998, page i, http://www.isofish.org.au/news/reports.htm (site visited 27 March, 2001).

[187] CCAMLR-XVII, 12.22, pp.84-85.

[188] ISOFISH, *Occasional Report No 3: The Vikings: The Involvement of Norwegian Fishermen in Illegal and Unregulated Longline Fishing for Patagonian Toothfish in the Southern Ocean*, 20 October 1998, http://www.isofish.org.au/news/reports.htm, (site visited 27 March, 2001). See also Gunnar Album, *The Patagonian Toothfish and Norwegian Interest*, Report 3/97, Norwegian Society for the Conservation of Nature, Friends of the Earth, http://www.naturvern.no/english/patagon.html, (site visited 16 January 2001).

[189] ISOFISH, *Occasional Report No 2: The Chilean Fishing Industry: its Involvement in and Connections to the Illegal, Unreported and Unregulated Exploitation of Patagonian toothfish in the Southern Ocean*, 31 March 1999, http://www.isofish.org.au/news/reports.htm, (site visited 27 March, 2001), p.1.

Argentinan boats which sweep across the Southern Ocean from southern South America, pillaging sub-Antarctic EEZs as they go."[190] Spanish vessels tend to be rust buckets compared to the 'vikings' more modern vessels, with plate freezers rather than the modern blast freezers which allow a higher quality product that will fetch higher prices. The involvement of Spanish nationals and companies in IUU has been widely reported: "it's blatantly obvious to all except the Spanish government, it seems."[191] IUU fishing has been conducted by 'cowboys' (operators with one to two vessels), as well as by companies that operate many vessels.

It is not just a question of involvement in the poaching operation itself in the Southern Ocean, but also the landing, shipping, and marketing of the fish. At the XIX CCAMLR meeting in 2000, ASOC named names, pointing out specific instances where CCAMLR Member states were failing in their responsibilities. Spanish nationals continued to be responsible for the bulk of IUU fishing in the Southern Ocean, operating under flags of convenience. Uruguay still allowed Montevideo Port to be used by illegal fishers, responding only to specific complaints. Chile had not stopped factories processing illegal fish, or companies from exporting it. Japan still allowed IUU fish to be imported and traded in its markets. Canada had refused to implement CDS, allowing illegal toothfish from Chile to be re-exported into the United States.[192] Third-party states are also involved such, as the transshipping that occurred in Port Louis in Mauritius.

While many of the companies and top individuals involved in IUU fishing are Europeans, many of the ordinary crew of the vessels engaged in IUU fishing come from developing states. Conditions are difficult in the legal fishing industry, where there are long voyages, in cramped conditions, not being allowed to land on islands where conservation concerns

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[190] ISOFISH, *Occasional Report No 1: The Involvement of Mauritius in Patagonian Toothfish from Illegal and Unregulated Longline Fishing in the Southern Ocean, and What Might be Done About it*, August 1998, http://www.isofish.org.au/news/reports.htm, (site visited 27 March, 2001), p.9.

[191] *ECO*, 2, 26 October 2000, CCAMLR-XIX, Hobart Tasmania, http://www.asoc.org/ECO2.htm (site visited 27 March, 2001). See also 'White Gold', a television news video jointly released by TVE, UNEP, and WWF, April 19, 2000. ISOFISH, "Rogues Gallery", http://www.isofish.org.au/rogues/index.htm (site visited 27 March, 2001). Sr Mora of the Spanish company Morabal "felt quite comfortable in revealing and confirming his involvement in toothfish poaching in CCAMLR waters because he is breaking no laws in Spain – despite Spain being a signatory to CAMLR. His longliners and the companies which own them are all registered in countries of convenience which are not members of CAMLR – and are thus not bound by its rules. While Spain may be embarrassed by his behaviour, she has not yet seen fit to take responsibility for him despite his: being a Spanish citizen; living and working on Spanish soil; and being the director of several Spanish companies."

exist.[193] In the unregulated fishery, the labour conditions of working in the Southern Ocean, one of the most difficult oceans to work in, often in old rust bucket vessels, are even more difficult.[194] "When at sea, the crew habitually work long shifts of 14 to 16 hours a day and reports of officers resorting to physical violence, psychological pressure, withholding pay are common."[195] The *Mar del Sur I* was arrested by the French authorities on Reunion Island after it was denounced by its Chilean crewmembers for unsafe navigation conditions and serious engine failures.[196]

The Attempt by CCAMLR to Stop IUU Fishing

Because the existing framework of conservation measures proved inadequate to deal with IUU fishing, in the mid-1990s CCAMLR began to consider a wide variety of proposals to extend its regulatory framework and programmatic activities. In this section the development of conservation measures and their effectiveness in dealing with problems of third-party states, flag state enforcement, trade related measures, cooperation between members and IGOs, and VMS proposals will be discussed.

The problem of third-party states

CCAMLR had to some extent proceeded on the assumption that states interested in harvesting and conservation activities in the Southern Ocean would join CCAMLR, or at least respect its authority. However, not all states are created equal and some states lack the capacity or political will to be involved in CCAMLR. The problems are those of reflagging of CCAMLR member vessels, and fishing by flag vessels of non-member states. Two general approaches have been taken by the Commission to deal with these problems. The

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[192] ASOC, "Time for a Toothfish Moratorium", Hobart, October 23, 2000, http://www.asoc.org/pressrelease1.htm (site visited 27 March, 2001).

[193] Martin Exel, op. cit., p.107. Unexpected problems can also arise: "The oil content of toothfish created significant problems once the vessel began processing offal, with much of the initial meal having to be dumped back into the sea as it was rapidly gaining an internal temperature that could have created, effectively, internal combustion of the product kept on the vessel."

[194] See Chapter 5, note 172, p.187.

[195] ISOFISH, *Occasional Report No 2: The Chilean Fishing Industry: its Involvement in and Connections to the Illegal, Unreported and Unregulated Exploitation of Patagonian toothfish in the Southern Ocean*, 31 March 1999, http://www.isofish.org.au/news/reports.htm, (site visited 27 March, 2001), p.61.

[196] "SOS From Crew Members Allows the Detention of Chilean Fishing Vessel in the Indian Ocean", 6 November, 1998, Centro Ecoceanos, http://www.isofish.org.au/news/98/news.6nov98.sos.MardelSurI.htm (site visited on 27 March, 2001).

first has been to contact third-party states involved with IUU fishing to persuade them to join CCAMLR or take action to halt the activities that are undermining the CCAMLR regime. The second has been to pass a series of conservation measures aimed at improving compliance with CCAMLR rules by third-party states and their flagged vessels.

In 1996, Namibia said it wished to be involved with the Commission and would take steps to ensure compliance from Namibian vessels.[197] CCAMLR has taken steps to amend the System of Inspection to address the actions of non-contracting parties, and has invited observers from non-Member states involved in the IUU fishing. Mauritius and Namibia were invited to the 1998 meeting.[198] They both attended in 1998 and 1999. For the 1999 CCAMLR meeting, Belize, Denmark (in respect of the Faroe Islands), Panama, Portugal, the Seychelles and Vanuatu were also invited. Of these states, only Denmark was represented at the meeting.[199] A large proportion of diplomatic discussions regarding accession have involved Australia as the depositary to the Convention.[200]

In 1997 the Commission adopted Conservation Measure 118/XVI, 'Scheme to Promote Compliance by non-Contracting Party Vessels with CCAMLR Conservation Measures'. Non-contracting party vessels engaged in fishing activities in the Convention Area, or transhipment activities, are now presumed to be undermining the effectiveness of the CCAMLR conservation measures. The Secretariat, all contracting parties, and the flag state of the vessel are to be informed when this activity is detected. If the vessel enters the port of a contracting party it is to be inspected and the landing or transhipment of all fish is prohibited unless it is established that they were caught outside the Convention Area or in compliance with conservation measures. This may have the effect of displacing catch landings away from member state ports. The measure was amended the following year and adopted as Conservation Measure 118/XVII with the addition of a reference to including information from VMS. One example of the effect of this conservation measure occurred in March 2000 when the Belize registered vessels *Cisne Rojo* and *Cisne Azul* were unable

[197] CCAMLR-XV, 17.3, p.90.
[198] CCAMLR-XVI, 5.36-5.37, p.12, the text of the letter can be found in Annex 6, p.152.
[199] CCAMLR-XVIII, 1.5, p.1.
[200] In 1999/2000 Australia undertook discussions with Mauritius, Namibia, Vanuatu, and Portugal concerning accession. Australia, *Report of Members Activities in the Convention Area for the Year to 30 June 2000*, p.4.

to prove that they had not been fishing in contravention of CCAMLR requirements, and withdrew a request for port access to Fremantle, Western Australia.[201]

Victoria Hallum suggested using a regional blacklist like the South Pacific Forum Fisheries Agency (FFA) has used, but recognised that the sovereignty problems would probably rule this out.[202] The developing international environmental law and law of the sea is still 'soft' in this area, and it really requires domestic implementation for success. Port state controls can be used by CCAMLR members on vessels flagged to non-members, but this does not stop vessels from using non-member country ports. Market-end controls in CCAMLR member nations may be more effective, possibly based on the ICCAT model.[203]

At the 2000 meeting the Commission adopted Resolution 13/XIX, 'Flagging and Licensing of Non-Contracting Party Vessels'. This recognised the situation that had been known for some time and, inspired by the FAO Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas, it urged the Contracting Parties to avoid flagging or licensing vessels to fish in waters under their jurisdiction if the vessel had a history of engagement in IUU fishing in the Convention Area. This resolution also touches on flag state enforcement measures, and international cooperation. Mauritius appears to have decided to cooperate with the CDS, following pressure from France, Australia, New Zealand, United States and South Africa.[204] Mauritius may have found that it was in its long term interests to continue to be the subject of bad publicity in the local and international press. This does not automatically close Port Louis to poachers and the test of the commitment to the CDS will be the manner in which Mauritius attempts to verify whether the toothfish has been caught outside the Convention Area or in accordance with CCAMLR conservation measures.

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[201] Australia, op. cit., pp.13-14.
[202] Victoria Hallum, *The Convention on the Conservation of Antarctic Marine Living Resources*, LLM Research Paper International Law of the Sea (LAWS 536), Victoria University Wellington: Law Faculty, 1997 pp.51-52.
[203] ibid., pp.59-61.

Flag state enforcement measures

In 1997, Conservation Measure 119/XVI 'Requirement for Contracting Parties to Licence their Flag Vessels in the Convention Area' was adopted. This requires the contracting parties to prohibit fishing by their flag vessels in the Convention Area unless they have a licence or permit. A licence may only be issued to a vessel flying the flag of the contracting party and the vessel must be capable of fulfilling the requirements of the various conservation measures. The following year, Chile and the EC tabled draft measures based on Conservation Measure 119/XVI, the difference lying in the language used in respect of the licensing regime required. This became adopted as Conservation Measure 119/XVII 'Licensing and Inspection Obligations of Contracting Parties with regard to their Flag Vessels Operating in the Convention Area'.[205] This added the requirement that licenses to fish for flag vessels were only to be granted if the contracting party was satisfied that it had the ability to exercise its responsibilities. Verification procedures were improved and information reporting required.

In 1998 Conservation Measure 146/XVII 'Marking of Fishing Vessels and Fishing Gear' was adopted. This required contracting parties to ensure that their licensed fishing vessels are marked in such a way that they can be readily identified in accordance with internationally recognised standards. Marker buoys and similar floating objects should be clearly marked as to which ship they belong to.[206] The growing amount of referencing between conservation measures is an indication of the growing complexity of arrangements to deal with the problems facing CCAMLR.

There was a proposal from Australia in 1998 that contracting parties provide a general description of their vessels to the Secretariat in addition to the information being currently supplied. This would create a CCAMLR Vessel Register. The Commission noted that there may be benefits to providing information about vessels to non-contracting parties and

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[204] "Fishing for Patagonian Toothfish. Mauritius Adopts the Catch Documentation Scheme", http://www.isofish.org.au/news/00/news.12.Nov.00.MauritiusAdoptsCDScheme.htm (site visited 27 March 2001).
[205] CCAMLR-XVII, 5.42-5.47, p.20.
[206] CCAMLR-XVII, p.46.

Namibia and Mauritius were to be allowed to access this information. Further development of a CCAMLR Vessel Register was left for intersessional work.[207]

At SCOI in 1998, New Zealand tabled a proposal to consider the application of national jurisdiction by CCAMLR parties to their nationals and companies in respect of fishing activities in the Convention Area. The EC and other members held that 'nationals' refers to 'vessels' and that only the flag state can exercise jurisdiction on the high seas.[208] New Zealand's position was "that Parties to CCAMLR must take responsibility for their companies and nationals in Antarctic waters ... In that regard, New Zealand will hold Parties accountable for the activities of their nationals that undermine the objective of the Commission."[209] New Zealand was prepared to act if any IUU activities occurred in the Ross Sea, an area associated with the sovereignty claim made by New Zealand to the Ross Dependency.

In 1999 Norway thought it important that the CDS be built on the principle of flag state responsibility.[210] This would strengthen the signal sent to poachers. Norway described an approach that it had developed that implies the denial of licenses to vessels that have participated in IUU fishing even when the vessel is operated by people who have not themselves been involved in IUU fishing.

> Vessels which previously have taken part in an unregulated fishery in the northeast Atlantic have been denied a licence in Norwegian waters even after being flagged to another State. It should be noted that such vessels would also not be allowed to fly the Norwegian flag. The Norwegian experience so far is that these new measures have led to vessel owners thinking more than twice before engaging in unregulated fisheries on the high seas.[211]

The second-hand value of these vessels is greatly reduced. A similar example is presented by Japanese licensing of Japanese citizens for tuna fishing regardless of the nationality of their vessel.[212]

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[207] CCAMLR-XVII, 5.55-5.58, p.21.
[208] CCAMLR-XVII, 5.62-5.64, p.22.
[209] CCAMLR-XVII, 5.63, p.22.
[210] CCAMLR-XVIII, 5.18, pp.14-15.
[211] CCAMLR-XVIII, 5.18, p.15.
[212] "Japan Takes Steps on Fishing Under Flags of Convenience", 2 October, 1998, http://www.isofish.org.au/news/98/news.2oct98.japan.flagsofconvenience.htm (site visited on 27 March, 2001).

CCAMLR might contribute positively to this trend of negotiating limited authority over flag state vessels if the members can agree it might help solve the problems of IUU in the high seas parts of the Convention Area. On the balance of discussion in the Commission to date it appears that measures that work against the flag state principle are unlikely to be adopted. NGOs continue to advocate measures that build on UNIA and the FAO Compliance Agreement. "All this talk about the sacrosanct nature of flag state responsibility is a red herring; flag state actions alone will not eradicate illegal and unregulated fishing."[213] The differing views prevent full use being made of innovative flag state measures. Resolution 13/XIX on 'Flagging and Licensing of Non-Contracting Party Vessels' may be a tentative step towards progress in this area.

Trade related measures

In 1997, consideration of trade-related measures led to the adoption of a recommendation calling for members to collect information related to trade of toothfish in order to understand where it is landed, transshipped, and imported, and the names it is sold under, and to provide this to the Secretariat for distribution to the members.[214] It was also agreed that an exchange of information should be established by CCAMLR on all vessels known to have fished in contravention of CCAMLR conservation measures.[215] One problem in tracking the trade flows for *Dissostichus* spp. is that there is a wide variety of common and market names in use for them. One example of this occurred when it was renamed Chilean sea bass to capitalise on existing demand for sea bass. This variety of names complicates the basic collection of statistics. The United States required the use of specific harmonised system codes on all documentation accompanying the import of *D. eleginoides* from 1 January 1998, a practice that the Commission recommended other members should adopt.[216]

In 1998, at CCAMLR XVII, the United States tabled two draft conservation measures based in part on the statistical documentation scheme of ICCAT, and Australia made a similar proposal. These were revised and combined together to form the basis of a Catch

[213] "Time to Get Real", *ECO*, Volume CXXXVIII No. 4, 5 November, 1998, Hobart, Australia.
[214] CCAMLR-XVI, 8.11, p.26.
[215] CCAMLR-XVI, 8.12, p.26.
[216] CCAMLR-XVII, 5.26-5.30, p.18.

Certification Scheme.[217] The basic principles of the draft were that the catch certificate system should be based on flag state responsibilities and that it must be consistent with international trade agreements such as WTO.[218] One measure would establish a framework for tracking the landings and trade flows of toothfish, and the second measure would provide for contracting parties to deny their markets to imports of toothfish caught by IUU fishing.[219] Although many members supported the scheme, consensus could not be reached by the Commission due to concerns that several members had over the applicability of the scheme to catch taken outside the Convention Area, or within the EEZ of coastal states.[220] The Commission did agree that the proposal was urgent and important and it was agreed that an intersessional meeting should be held early in 1999 to develop the catch certification scheme so that it could be adopted at CCAMLR-XVIII.[221]

In 1999 the Catch Certification Scheme changed and become referenced to as the Catch Documentation Scheme. Work on it continued at an ad hoc meeting of CCAMLR members held in Brussels, Belgium, in April 1999. Japan objected to ASOC attending as an observer and ASOC lobbyists were cut off from approaching delegates.[222] Further intersessional discussions resulted in a draft scheme sponsored by the United States, the EC, and Australia.[223] The XXIII ATCM was held in Lima, Peru on 24 May – 4 June 1999, and its third resolution represented an unprecedented intervention by the ATCPs in the management of the CCAMLR regime. The ATCPs:

> Recommend that Consultative Parties which are Members of CCAMLR take action within their competence to support strongly the CCAMLR Commission in its efforts to deal with the problem of illegal, unreported and unregulated fishing in the Convention Area, including adoption of a catch documentation scheme at the Commission's XVIII meeting in Hobart, 1999, and to consider further measures consistent with the obligations each Contracting Party has under CCAMLR.[224]

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[217] CCAMLR-XVII, 5.16, p.17.
[218] CCAMLR-XVII, 5.17, p.17.
[219] CCAMLR-XVII, 5.18, p.17.
[220] CCAMLR-XVII, Annex 5, 2.46, p.8.
[221] CCAMLR-XVII, 5.20-5.22, p.17.
[222] "Continuing Crisis in the Southern Ocean", *The Antarctic Project Newsletter*, 8 (2), July 1999, http://www.asoc.org/currentpress/jul99new.htm (site visited 27 March 2001).
[223] CCAMLR-XVIII, 5.10-5.12, pp.12-13.
[224] *Final Report of the XXIII Antarctic Treaty Consultative Meeting*, Lima, Peru, 24 May - 4 June 1999, Annex C, Resolution 3 (1999) Support for CCAMLR. A second ATCM resolution relating to CDS was also adopted at the 2000 ATCM in Russia. This was Resolution 1 (2001) 'Support for CCAMLR and its Measures to Combat Illegal, Unreported, and Unregulated Fishing, Including a Catch Documentation Scheme for *Dissostichus* spp. (Toothfish)'. It recommended that: "All Parties to the Antarctic Treaty which are not Contracting Parties to the Convention or Members of the Commission, and whose flag vessels fish for

At the CCAMLR XVIII meeting, Senator Hill "stressed that failure to deal promptly and effectively with the IUU fishing issue by the adoption of an effective Catch Documentation Scheme would not only have serious conservation consequences but would also damage the reputation of CCAMLR as an effective international conservation body".[225] The EC stated that a pre-requisite to successful implementation is the introduction of separate classification codes in trade statistics, and that the scheme "will not be a panacea for all the current problems relating to IUU fisheries."[226] Japan's position was that the CDS should not be a trade restriction measure, that implementation should not discriminate against non-contracting parties to CCAMLR, or be problematic to member states.[227]

In 1999, Conservation Measure 170/XVIII 'Catch Documentation for *Dissostichus* spp' was adopted. Domestic measures to implement the CDS were to come into force by 4 May 2000. Members were urged to implement as quickly as possible. Information was to be communicated to all interested states, and non-Contracting Parties were invited to participate in the scheme. Careful handling was required of the commercially sensitive data. Chile, New Zealand, and South Africa voluntarily agreed to extend the application of the CDS conservation measure to waters within their own EEZ.[228] Argentina reserved its sovereignty rights over disputed territory.[229] A significant factor in the adoption of the CDS was leadership at a high political level. This can be seen in the political involvement of Ministers, such as Senator Hill addressing CCAMLR, and the New Zealand Ministerial on Ice. The ATCM resolution in Lima was also very important in demonstrating the political will that existed for the CDS. The United States also played a leadership role and it was considering proposing a CITES listing if regulatory measures were not adopted.[230]

In May 2000 ISOFISH reported that poachers were changing vessel names in an attempt to make it more difficult for the CDS to identify toothfish caught in IUU fishing.[231] It is

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toothfish or who are involved in the trade of toothfish, implement the CCAMLR Catch Documentation Scheme for *Dissostichus spp.*"

[225] CCAMLR-XVIII, 5.14, p.13.

[226] CCAMLR-XVIII, 5.16, pp.13-14.

[227] CCAMLR-XVIII, 5.22, p.17.

[228] CCAMLR-XVIII, 5.36, p.19, and 5.38-5.39, p.20.

[229] CCAMLR-XVIII, 5.37, p.19.

[230] Testimony of Penelope Dalton, Before the Committee on Resources U.S. House of Representatives, July 13, 1999. http://www.legislative.noaa.gov/citests0713.htm (site visited 27 March 2001).

[231] ISOFISH, *Occasional Report No 4: Using the Lloyds Register of Shipping to Track Toothfish Poachers Changing Vessel Names in an Attempt to Avoid Identification by the CCAMLR Catch Documentation Scheme*, May 2000, http://www.isofish.org.au/news/reports.htm, (site visited 27 March 2001).

possible to track name changes through Lloyds Register of Shipping. ISOFISH urged that the unique number assigned by Lloyds to vessels be required on the catch documentation form. The use of 'front' or 'dummy' companies also serves to insulate vessel owners from responsibility and liability. ISOFISH claimed that both vessels and companies involved in IUU fishing are almost all now registered in 'flag of convenience' countries. Greenpeace was concerned that Spanish operators might switch to Brazil as Panama began discouraging the use of their shipping register.[232] The first visible success of the CDS occurred when the New Zealand flagged vessel *Polar Viking* was denied entry into Uruguay in June 2000, where it had attempted to land twenty-nine tonnes of toothfish in Montevideo.[233] The vessel was later denied entry into the United States, but was reported as reflagging to St Vincent and the Granadines.[234]

The ASOC assessment of CDS was that it was inadequate, unsuccessful, and not completely implemented by members.[235] It is difficult to expect non-members to cooperate when the members have not taken the necessary administrative and legal steps. The EU was one such slow-moving member, although Spain had unilaterally provisionally implemented the CDS.[236] Greenpeace was also critical of the CDS: "It requires the broader membership and established implementation mechanisms of an international trade monitoring and regulatory body, which CCAMLR does not have."[237] The CDS does not require CCAMLR members to refuse entry to toothfish catches from the Convention Area that were caught by non-parties. Refusal only occurs if the documentation has not been filled in correctly. One area of concern was that IUU catch can be declared as 'high seas' catch as the CDS lacks verification mechanisms, and CCAMLR can not rely on IUU vessels to correctly report their position. There is also concern that the IUU operators will attempt to develop markets in non-CCAMLR member states, such as China. "Japan is not

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[232] "Brazil Decides to Enter Toothfish Fishery", June 2000, http://www.isofish.org.au/news/00/news.June00.BrazilEntersToothfishFishery.htm (site visited 27 March 2001).

[233] New Zealand, *Report of Member's Activities in the Convention Area 1999/2000*. The vessel had requested and was declined certification under the CDS by New Zealand authorities. Investigation did not find clear evidence of fishing in CCAMLR waters.

[234] "Whither the 'Polar Viking?", *ECO*, 2, 26 October 2000, CCAMLR-XIX, Hobart Tasmania, http://www.asoc.org/ECO2.htm (site visited 27 March 2001)

[235] See pp.187-188 above for more details of the ASOC viewpoint.

[236] "EU Delays While Spain Acts on CDS", *ECO*, 1, 23 October 2000, CCAMLR-XIX, Hobart, Tasmania, http://www.asoc.org/ECO1.htm (site visited 27 March 2001).

[237] "A Critique of the CCAMLR Catch Documentation Scheme [1999] as a Mechanism to Prevent Illegal, Unregulated and Unreported Fishing For Toothfish Species in the Southern Ocean", Greenpeace Briefing, February 2000.

willing to comply even with the weakened version of the CDS, as it says it will not prevent imports even if the fish were caught in the CCAMLR area in contravention of CCAMLR Conservation Measures, so long as the catch document has been filled in correctly."[238]

In 2000 the CDS was amended and adopted as Conservation Measure 170/XIX. The changes were relatively minor, improving the administration of the scheme, notably with a reference to using rapid electronic means when sending copies of catch documents to the CCAMLR Secretariat. Resolution 14/XIX 'Catch Documentation Scheme: Implementation by Acceding States and Non-Contracting Parties' was also adopted. The Commission was conscious that the effectiveness of CDS depended on implementation by acceding states as well as non-contracting parties, and was especially concerned by the failure of acceding states to meet their obligations under Article XXII of the Convention. The effect of this resolution will probably be that diplomatic pressure will be exerted by the members of the Commission to improve compliance from the acceding states. The matter will be revisited at CCAMLR-XX in 2001. A second CDS related Resolution, 15/XIX 'Use of Ports not Implementing the Catch Documentation Scheme for *Dissostichus* spp.', was also adopted. This urged the Contracting Parties to discourage their flag vessels from using ports in states which were not implementing the CDS. A third resolution, 16/XIX 'Application of VMS in the Catch Documentation Scheme', was adopted. This was an agreement on a voluntary basis for states participating in CDS to ensure their vessels involved in fishing or transhipping *Dissostichus* spp. used VMS.

Cooperation between members and cooperation with other IGOs

The issue of participation with the Convention seems to have changed over the years to becoming an issue of cooperation with the Convention. Cooperation requires working with other elements of the ATS, third-party states, and other international organisations. The ATS has been extended since CCAMLR entered force, and many new international organisations have been created. Although the CCAMLR members might prefer that other states accede to the treaty, they have had to deal with the fact that not all states are willing or able to do so.

[238] ibid.

There are several reasons for CCAMLR to look to other organisations and regimes for assistance in dealing with the IUU fishing problem. Other regimes are potential sources for new ideas for conservation measures. Some problems are such that one regime is unable to address them effectively by itself. This can lead to increased cooperation with other regional regimes dealing with the problem, with global regimes dealing with that issue, or the creation and promotion of new regimes to cover the regional or global gaps. Argentina observed in 1997 that "the issue is complex and could only be resolved if CCAMLR takes a global approach."[239] Some measures in 1997 were drawn from experience with NAFO and ICCAT, others took into account regime development elsewhere, such as the 1995 UN Straddling Stocks Agreement and the 1993 FAO Compliance Agreement.[240] The 1990s was a period when many big conventions were negotiated to deal with the problems of the marine fisheries of the globe.

In 1994, a general policy on the designation of CCAMLR observers to other International conferences or meetings was established.[241] In 1995, the ATCM requested an opinion from CCAMLR on some points relating to Article 2 of the draft Annex on Liability to the Madrid Protocol.[242] In 1996, the relevance of UNIA to CCAMLR was discussed.[243] Australia saw UNIA and CCAMLR as complementary and mutually reinforcing. CCAMLR parties were requested to consider the implications of UNIA for themselves and CCAMLR, and to consider becoming parties. In 1998 some members expressed their regret that the FAO observer was unable to contribute to discussions in SCOI.[244]

A need for closer collaboration between CCAMLR, CCAS and IWC has been raised before, and Kock also suggested merging the largely inactive CCAS into CCAMLR to avoid duplication of work.[245] Coordination between CCAMLR and the IWC can result in some friction. In 1987 the Japanese were proposing at the IWC to take minke and sperm whales for research and it was deemed "inappropriate for the CCAMLR Scientific Committee to comment further on this topic at present."[246] In 1990 efforts at a joint

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[239] CCAMLR-XVI, 5.38, p.13.
[240] CCAMLR-XVI, 5.25, p.11.
[241] CCAMLR-XIII, 12.9-12.15, pp.54-55.
[242] CCAMLR-XIV, 10.6-19.9, p.60.
[243] CCAMLR-XV, 7.32-7.34, pp.29-30. CCAMLR parties were requested to consider the implications of the agreement, and to consider becoming members to the agreement.
[244] CCAMLR-XVII, 12.3, p.82.
[245] Karl-Hermann Kock, op. cit., p.16.
[246] SC-CAMLR-VI, 7.48, p.52.

workshop on baleen whales seemed to go awry when the IWC called it off without explaining why it thought the original terms of reference were inappropriate. The Scientific Committee did not think the proposed replacement, a joint workshop on all krill predators, was appropriate.[247]

The objective of the draft measure tabled by the EC that became 'Conservation Measure 147/XVII 'Cooperation between Contracting Parties to ensure Compliance with CCAMLR Conservation Measures with Regard to their Vessels' was to ensure the cooperation of contracting parties, especially when vessels of one contracting party entered the port of another contracting party. Japan expressed reservations about the feasibility of complying due to the limited number of inspectors available in its ports.[248] South Africa, the United States, and Chile made statements as to their understanding on how this affected Article IV of the CCAMLR Convention.[249] These measures refer to a 'spirit of cooperation' to take appropriate action when investigating infringements. The measures was amended the following year and adopted as Conservation Measure 147/XVIII. This measure was more focused on *Dissostichus* spp. In 2000 the measure was amended again and adopted as Conservation Measure 147/XIX. This added a requirement for contracting parties to advise the Secretariat when any vessel was denied entry to a port or permission to land or transhipment *Dissostichus* spp. Vessels seeking to enter a port were required to make a written declaration that they had not engaged in or supported IUU fishing in the Convention Area.

In 1998 Australia tabled a draft action policy that proposed a comprehensive approach for the elimination of IUU fishing in the Convention Area.[250] This proposal included, *inter alia*, harmonising conservation efforts with recent developments in international law, examining approaches consistent with the Convention for areas adjacent to the Convention Area, and approaches for cooperation with non-Contracting Parties. The proposed action plan was not well received by many of the members. Further development of an action plan was left for the intersessional period.

The relationship between CCAMLR and the Madrid Protocol is one where friction might arise if CCAMLR is unable to fulfil its conservation objective. There is a possible

[247] SC-CAMLR-IX, 5.50-5.52, p.44.
[248] CCAMLR-XVII, 5.48-5.51, p.20.
[249] CCAMLR-XVII, 5.52-5.54, p.21.
[250] CCAMLR-XVII, 5.23-5.25, pp.17-18, and 5.59-5.61, pp.21-22.

jurisdictional problem as Annex V of the Madrid Protocol includes the concept of MPA.[251] A proposal has been taken to CCAMLR by New Zealand for a MPA around the Balleny Islands in the Ross Sea.[252] This initiative is supported by ASOC, and the IUCN in 1996 believed it was timely for CCAMLR to consider establishing a system of MPAs "in order to ensure the preservation of representative areas of the principal habitats and biodiversity of the Antarctic region."[253]. Potentially this could protect sea birds and vulnerable fish stocks from regulated exploitation, but not IUU fishing. No progress was made at ATCM XXIII or CCAMLR-XIX. Given the time that the proposal has been discussed, for it seems likely that some ATCPs and CCAMLR members are opposed to the concept of MPAs in the Southern Ocean. One reason for this may be that fishing states are interested in preserving access to fisheries. Another may be that some non-claimants are reluctant to appear to reinforce New Zealand's sovereignty claim in the Ross Dependency. The real loss is the stifling of innovation, as also happened with the Norwegian proposals on flag state enforcement.[254]

Many issues in the Southern Ocean can only be tackled through collaboration with other organisations responsible for conservation and management at the global level, and in the areas adjacent to the Convention Area. Seeking closer collaboration will have a high priority for CCAMLR in the future.[255] Increasingly the CCAMLR regime is forging links to other organisations. Members report information from other meetings they attend; facilitating the exchange of ideas and information. In coming up with solutions to problems of enforcement CCAMLR does not appear as innovative as it once was. The ICCAT Bluefin Action Plan Resolution of 1994 is similar to the CDS in that it bans the import of Tuna not caught in accordance with regulations. The NAFO restrict landings of fish caught by non-members, but the compact high seas area it is responsible for allows close

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[251] Madrid Protocol, Annex V, Article 3, (1) "Any area, including any marine area, may be designated as an Antarctic Specially Protected Area".

[252] "No where in the Antarctica [sic] has an entire archipelago and the adjacent marine ecosystem been afforded protection in a comprehensive manner. By designating the Balleny Islands as a Specially Protected Area, an important gap in the Antarctic protected area system will be filled.", *Proposed Specially Protected Area Balleny Islands, Antarctica*, Antarctic Policy Unit, Ministry of Foreign Affairs and Trade, 25 August, 1999.

[253] CCAMLR-XV, 11.13, pp.75-76.

[254] See Chapter 5, p.196.

[255] Kock, Karl-Hermann (ed), *Understanding CCAMLR's Approach to Management*, May 2000, http://www.ccamlr.org/English/e_pubs/e_app_to_manag/TEXT_final_.pdf, (site visited March 19, 2001), p.8.

monitoring, and an effective moratorium. CCAMLR may be more of a leader when it comes to seabird by-catch solutions.

Vessel monitoring system

There are some general limits on satellite surveillance in the Southern Ocean, as it is too far south for some satellite orbits, and weather problems can prevent observation. VMS relies on different principles – tracking signals emitted by the vessels carrying a transponder. VMS allows an indication to be made when a vessel enters the Convention Area or any particular reporting area. Inferences can be made about fishing effort from the time spent in fishing grounds.[256] As Bailey and Muehlhausen put it: "The eve of the 21st century is certainly the time for the international community to acknowledge that the traditional method of vessel recognition, flying a flag off the vessel's stern, is hardly more than a quaint custom with little relevance to a world whose future may depend on rational management of food from the seas."[257]

The Secretariat began investigating the use of Transponders following the 1993 meeting,[258] and in 1994 the use of VMS was considered by SCOI.[259] Poland and Japan were of the opinion that VMS was not required for krill fishing due to its current low level and lack of closed areas or seasons.[260] In 1995, Norway, Australia, and the UK were disappointed that a consensus on the introduction of an automated VMS had not been reached.[261] Chile and Argentina argued that they were taking appropriate measures as flag states but they did not want to establish a system they saw as incompatible with rights under the Law of the Sea Convention.[262] The UK and the United States argued that there was nothing in international law preventing the implementation of mandatory vessel notification or VMS.[263] The IUCN Observer expressed concern that some members considered CCAMLR to not be a regional fisheries agreement. Their view was "that CCAMLR is very much a fisheries agreement –

[256] James E. Bailey and Laurel A. Muehlhausen, "Marine Boundary Enforcement from Space: Satellite Technology and Fisheries Jurisdiction" in Gerald Henry Blake et. al. (eds), *The Peaceful Management of Transboundary Resources*, Graham & Trotman/Martinus Nijhoff: London, 1995, p.419.
[257] ibid., p.421.
[258] CCAMLR-XII, Annex 5, 35-36, p.107.
[259] CCAMLR-XIII, 5.22-5.24, pp.17-18.
[260] CCAMLR-XIII, 5.24, p.18.
[261] CCAMLR-XIV, 7.4-7.6, p.22.
[262] CCAMLR-XIV, 7.9, p.22, and 7.13, p.23.
[263] CCAMLR-XIV, 7.6, p.22, and 7.15, p.23.

albeit a special one, but not an exceptional one."[264] Other differences existed in relation to the practical, administrative, and financial aspects of implementing a VMS.[265] Many members saw VMS as offering a good option for dealing with the problem of illegal fishing.[266] In 1996 a number of CCAMLR Members had already implemented VMS in waters under national jurisdiction. Japan and Poland reminded the Committee that the 1994 meeting had not seen any need to introduce VMS for the krill fishery,[267] which seems a little disingenuous given their opposition to the proposal in 1994.

In 1997 the Commission adopted Resolution 12/XVI in response to IUU harvesting of toothfish. Members were encouraged to establish automated VMS to monitor their flag vessel positions in waters adjacent to the Convention as well.[268] There was an attempt to implement a Conservation Measure on VMS, with proposals coming from Chile and the European Community, but a draft measure recommended by SCOI was not agreed on by the Commission.[269] The Republic of Korea stated that it needed more time to complete the domestic arrangements needed, and that it believed that it was premature to apply VMS to the squid fishery.[270] This resolution prompted a round of demonstrations between the UK and Argentina over their positions on the Falkland/Malvinas Islands. Argentina reserved its position in respect of Subareas 48.3 and 48.4, as it does not recognise the UK as a coastal state in the Convention Area. The UK saw no need for a reservation as the Resolution was not binding on Parties to the Convention and asked for a reasoned explanation of the reservation, without which the UK was of the view that the reservation could have no effect.[271]

In 1998 a draft conservation measure was tabled by the EC and its basic approach was that all fishing vessels should be covered by VMS. A number of countries; including Poland, Russia, Ukraine, and the Republic of Korea, held to their view that krill fishing vessels should be exempt for the time being from any VMS requirement. This was a view that the EC was willing to accommodate in the interim, however the proposed system was not practicable for several members, with Korea viewing itself unlikely to introduce VMS

[264] CCAMLR-XIV, 11.10, p.64.
[265] CCAMLR-XIV, 7.33, pp.27-28.
[266] CCAMLR-XIV, Annex 5, 2.30-2.67, pp.132-138. This is a long discussion of the issues and problems.
[267] CCAMLR-XV, 7.29, pp.28-29.
[268] CCAMLR-XVI, 9.56-9.58, p.35.
[269] CCAMLR-XVI, Annex 5, Appendix VI, "Draft Conservation Measure D", p.147.
[270] CCAMLR-XVI, Annex 5, 1.70 – 1.72, p.133.

earlier than 1 January 2000.[272] A number of members supported the view expressed by New Zealand that the introduction of VMS was a positive step, but that it was regrettable that not all countries were able to immediately introduce VMS and that krill vessels were excluded.[273] Each contracting party was to establish a VMS by 1 March 1999 to monitor the position of any vessel that it might license to harvest marine living resources in the Convention Area for which restrictions have been set by conservation measures. A contracting party unable to establish a VMS by 1 March 1999 should establish one no later than 31 December 2000. The VMS technical requirements were specified, the possibility of technical failure covered, and the action required if a VMS ceased to operate. A draft resolution was presented by Australia in SCOI on making a wider use of VMS, but there was no agreement within SCOI. Parties were encouraged to consider requiring the use of VMS in areas adjacent to the Convention Area if they were not already doing so.[274] The EC reiterated its proposal that VMS apply to all krill fishing vessels. Japan and some other members were not willing to accept the proposal at that time.[275]

The continued resistance by the fishing nations to any restrictions that VMS might place on their freedom to fish is an interesting indicator as to their lack of commitment to the objective of conservation and compliance with CCAMLR measures. It is difficult to see why a state committed to rational use of the resource with its requirement of sustainable use can continue to object to improving the ability of the CCAMLR regime to monitor what is actually occurring in the fisheries it is responsible for managing. In 2000 there was an interesting development when Resolution 16/XIX was adopted calling for the voluntary establishment of VMS in all flag vessels authorised to fish or transhipp *Dissostichus* spp. on the high seas.

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[271] CCAMLR-XVI, 9.59-9.66, pp.35-36.
[272] CCAMLR-XVII, 5.33-5.37, p.19.
[273] CCAMLR-XVII, 5.38-5.39, p.19.
[274] CCAMLR-XVII, 5.40-5.41, pp.19-20.
[275] CCAMLR-XVIII, 8.8, p.30.

The By-catch and Incidental Mortality Issue

The definition of by-catch used by CCAMLR is: "The catch in numbers or in weight of non-target species taken in a directed fishery."[276] Incidental mortality is a related concept that was first introduced to CCAMLR in 1984.[277] In 1985 the problem of by-catch in the krill fishery was noted as "might potentially cause a management problem",[278] but it was "not, at the present, a management problem."[279] At this time the Commission restricted itself to asking for reports of incidental catches and a review of gill net operations.[280] In 1986 information provided by members suggested that incidental mortality was not an immediate problem in the Convention Area, but incidental mortality could interfere with efforts to achieve the objective of the Convention.[281] At this stage the Commission decided to build up more information on marine debris and asked for members to report on birds and mammals taken as incidental catch.[282] In 1992 there was a division of work, where the Scientific Committee would work on the ecological impact of the incidental mortality of marine mammals and birds, while the Commission would deal with general issues such as marine debris, dumping waste at sea, and pollution.[283]

Impacts of fishing on the seabed

Most finfishing in the Southern Ocean used to be conducted with bottom trawls. The benthic fauna of the Southern Ocean is largely long-lived and slow-growing and the effects of bottom trawling are presumed to be long-lasting. Bottom trawling "affects the environment by scraping and ploughing of the seabed, sediment resuspension, and the destruction of benthos".[284] The potential impact has been minimised by measures prohibiting directed fishing for some dermesal species.[285] Because the expansion in

[276] CCAMLR Glossary of Terms, SC-CAMLR-XI, p.483.
[277] CCAMLR-III, 20-25, pp.4-6.
[278] SC-CAMLR-IV, 4.26, p.11.
[279] SC-CAMLR-IV, 4.29, p.12.
[280] CCAMLR-IV, 21-22, p.6.
[281] CCAMLR-V, 39, p.9.
[282] CCAMLR-V, 40-43, pp.9-12.
[283] CCAMLR-XI, 5.1, pp.14-15.
[284] Karl-Hermann Kock, "Fishing and Conservation in Southern Waters", *Polar Record*, 30 (172), 1994, p.8.
[285] Karl-Hermann Kock (ed), *Understanding CCAMLR's Approach to Management*, May 2000, http://www.ccamlr.org/English/e_pubs/e_app_to_manag/TEXT_final_.pdf, (site visited March 19, 2001), p.27.

fisheries in the Convention Area has mainly involved longlines, the effects of trawling on the seabed are not a major problem for CCAMLR at this time.

Entanglement of marine mammals in marine debris

Trawling can produce 'ghost nets'; fragments of lost and discarded fishing nets can entangle seals and other species. In 1987 members were encouraged to sign Annex V of MARPOL.[286] Annex V of MARPOL entered into force December 31 1988. MARPOL Annex V prohibits at-sea disposal of all plastics and places restrictions on garbage dumping. The ATCM-XV meeting made recommendations about waste disposal.[287] In 1988 some members reported marine debris and seal entanglements.[288]

Driftnet fishing was discussed by the Scientific Committee in 1990. Only Japan could not endorse a ban on driftnet fishing.[289] ASOC addressed the Commission on the subject of Driftnet fishing. The Commission noted that UNGA 44/225 would cause a moratorium on driftnet fishing to take place from 30 June 1992. Resolution 7/X 'Driftnet Fishing in the Convention Area' endorsed UNGA 44/225 "there will be no expansion of large-scale pelagic driftnet fishing into the high seas of the Convention Area."[290]

In 1998 the Commission remained working on the problems associated with marine debris. Debris picked up on beaches often reflected local fishing activities, even illegal activity.[291] The Commission was concerned by the continuing presence of packaging bands in the Convention Area. This was not necessarily due to a failure by CCAMLR member vessels to comply with Conservation Measure 63/XV 'Regulation of the Use and Disposal of Plastic Packaging Bands on Fishing Vessels', as the bands could be the result of IUU fishing.[292]

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[286] CCAMLR-VI, 41, p.12.
[287] CCAMLR-VIII, 33, pp.7-8.
[288] CCAMLR-VII, 27, p.6.
[289] SC-CAMLR-IX, 7.21, p.50.
[290] CCAMLR-IX, 5.8-5.16, pp.18-19.
[291] CCAMLR-XVII, 6.10. p.24. South Africa noted a substantial increase in beach litter at Marion Island after the onset of illegal fishing. Of note here was the increase in items in Spanish and French script.
[292] CCAMLR-XVII, 6.16, p.25.

Problems with marine debris pollution, mainly originating from fishing vessel activities, were persisting in 1999.[293] New Zealand and South Africa reported that their fishing vessels were returning non-biodegradable waste back to port for disposal.[294] This behaviour is now required under MARPOL Annex V, and Annex IV to the Protocol on Environmental Protection to the Antarctic Treaty and the Commission urged all CCAMLR flag states to comply.[295] Entanglement in packaging bands has decreased, but entanglement is now occurring in longlines. Monitoring shows that debris has not decreased and there is much room for improvement.[296]

Incidental mortality of fishing on seabirds

Incidental mortality of seabirds has not always been considered a significant problem by CCAMLR. Fisheries can provide a considerable amount of additional food for albatrosses and other sea birds through feeding on the discards from vessels. At one stage it was thought that this might increase the chick rearing success.[297] In 1998 no decrease in the seabird population could "be linked at present with commercial harvesting in Antarctic waters."[298] However, by 1989 it was considered possible by the Commission "that there is substantial incidental mortality which is not being reported."[299] Decline was being observed in the numbers of southern elephant seals and the wandering albatross, the latter being attributed to longlining for tuna outside the Convention Area.[300] Concern was expressed because "similar fisheries elsewhere in the world had posed conservation problems which were difficult to detect from catch and effort statistics alone. In addition, there had been significant incidental mortality, particularly of albatrosses and large petrels".[301]

In 1989 CCAMLR passed Resolution 5/VIII concerned with incidental mortality and called on the parties involved in longlining to investigate and minimise incidental

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[293] CCAMLR-XVIII, 6.4, p.22.
[294] CCAMLR-XVIII, 6.6, p.22. New Zealand vessels lost 38,000 feet of longline. Personal Notes, Felicity Wong, GCAS Lecture, 13 January 2000.
[295] CCAMLR-XVIII, 6.8-6.9, p.23.
[296] Karl-Hermann Kock, op. cit., p.26.
[297] Karl-Hermann Kock, "Fishing and Conservation in Southern Waters", *Polar Record*, 30 (172), 1994, pp.6-7.
[298] SC-CAMLR-VII, 6.4, p.38.
[299] CCAMLR-VIII, 23, p.5.
[300] SC-CAMLR-VIII, 6.6-6.7, pp.40-41. SC-CAMLR-X, 7.5, p.58, the Southern Elephant seal declining in Indian and Pacific Ocean Sectors.

mortality.[302] Greenpeace was concerned with the incidental mortality issue very early on. In 1991 the Greenpeace polar vessel *Gondwana* observed Soviet longliners fishing for Patagonian toothfish around South Georgia. One boat was setting lines in daylight, and another boat was not using bird scaring devices during setting operations, despite the resolution from CCAMLR.[303] In 1990 the Commission agreed that longlines should be regulated to minimise mortality.[304] In 1991 these measures became obligatory with Conservation Measure 29/X. In 1992 it was pointed out that streamer lines need to be used during all daylight operations, including 'nautical twilight'.[305] The Russians developed the 'shori', or 'blinker' rather than use tori lines.[306] A major international campaign to reduce longline mortality was under way.[307] At this time the use of net monitor cables was being discontinued.[308] One technical development was that of a 'BIO bait box' that disintegrates if lost at sea.[309]

In 1990, Tuna longlining in the Sub-Antarctic was killing an estimated 44,000 albatrosses per year, "sufficiently high to substantiate claims that serious declines in albatross populations within the Convention area are due to this type of fishing activity."[310] Professor Lubimova pointed out that the *D. eleginoides* fishery is a bottom longline fishery, different from Tuna, with no reported by-catch in the Soviet longline fishery.[311] Dr Croxall pointed out that without full data it is difficult to tell if there is a difference between bottom and pelagic fishing, and that no reports of Tuna longlining by-catch were received until observers were on board.[312] At the 1993 meeting, it was reported that without streamer lines up to six albatrosses per set could be killed, potentially 2,346 birds killed in Subarea 48.3 in 1992/93.[313] There was a clear trend that the black-browed

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[301] SC-CAMLR-VIII, 3.13, p.16.
[302] CCAMLR-VIII, 129-130, pp.33-34.
[303] Janet Dalziell, and Maj De Poorter, op. cit., pp.143-144.
[304] CCAMLR-IX, 5.3, p.16.
[305] SC-CAMLR-XI, 8.4, p.68.
[306] SC-CAMLR-XI, 8.15, p.69.
[307] SC-CAMLR-XI, 8.19, p.70.
[308] SC-CAMLR-XI, 8.26, p.71.
[309] SC-CAMLR-XI, 8.35, p.73.
[310] SC-CAMLR-IX, 7.3, p.47.
[311] SC-CAMLR-IX, 7.7, p.47.
[312] SC-CAMLR-IX, 7.8, p.48.
[313] SC-CAMLR-XII, 10.2, p.62.

albatross had declined in population since 1988.[314] It was noted that birds can become habituated to streamer lines, which reduces their effectiveness.[315]

The Scientific Committee recognised that incidental mortality, particularly from longline fishing, was an increasingly important part of its deliberations. There was too much information being collected for the Committee to review and give advice on it, so an ad hoc Working Group on Incidental Mortality Associated with Longline Fishing (WG-IMALF) was established.[316] WG-IMALF reported back that "the removal of bait by seabirds can reduce the catch of fishing significantly and that fishers themselves would benefit from helping to resolve the problem."[317] Cooperation efforts with other organisations were increasing.[318] WG-IMALF continued to meet as part of WG-FSA.

In 1994, Conservation Measure 29/XIII 'Minimisation of the Incidental Mortality of Seabirds in the Course of Longline Fishing or Longline Fishing Research in the Convention Area', was adopted. Baited hooks to sink quickly; lines to be set at night only; trash and offal not to be dumped while lines are set; release caught birds alive; streamer lines to discourage birds.[319] There was a general decrease in the rate of birds caught in the legitimate longline fishery. This was due to a combination of factors: night setting, streamers, and a later start to the fishing season after breeding had finished. "Many vessels, however, either did not use streamer lines or used them ineffectively, and increased compliance with this part of the conservation measures is required to further decrease seabird mortality."[320] The vessels should discharge offal off the side of the vessel away from where lines are being set.[321]

In 1995, CCAMLR had no evidence that vessels involved in illegal operations were using techniques to reduce mortality.[322] Conservation Measure 29/XIII was amended and

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[314] SC-CAMLR-XII, 10.8, p.63.
[315] SC-CAMLR-XII, 10.14, p.64.
[316] SC-CAMLR-XII, 10.19, pp.65-66.
[317] Karl-Hermann Kock (ed), *Understanding CCAMLR's Approach to Management*, May 2000, http://www.ccamlr.org/English/e_pubs/e_app_to_manag/TEXT_final_.pdf, (site visited March 19, 2001), p.25.
[318] CCAMLR-XIV, 5.19, p.18. ICCAT, Indian Ocean Fisheries Commission (IOFC), SPC, FFA, CCSBT, FAO, IWC, and the UN Conference on Straddling Stocks and Highly Migratory Fish Stocks.
[319] CCAMLR-XIII, pp.37-39.
[320] CCAMLR, *CCAMLR Newsletter*, 17, December, 1995, p.2.
[321] op. cit., p.3.
[322] CCAMLR-XIV, p.18.

adopted as Conservation Measure 29/XIV.[323] In 1996 it was amended again as the definition of 'nautical twilight' was clarified, and adopted as Conservation Measure 29/XV. An educational book was published by CCAMLR in 1996, *Fish the Sea Not the Sky*, demonstrating ways of minimising incidental mortality while fishing. In 1997 the Commission endorsed the idea that copies of the book should be sent to companies believed to be engaged in longline fishing in the Convention Area and adjacent regions.[324] Estimated 1995/96 seabird mortality from longline fisheries was 1,600 in Subarea 48.3.[325]

In 1997 there was general agreement among CCAMLR members that IUU fishing posed a serious threat to the survival of several species of seabirds in the Southern Ocean taken as incidental by-catch in longline fishing operations.[326] The estimated total of seabird mortality in the regulated fishery was 6,634, mostly albatrosses and white-chinned petrels.[327] Compliance in 1996/97 with Conservation Measure 29/XV was poor.[328] The Scientific Committee tried to estimate the incidental mortality in the unregulated fisheries in the Convention Area. "They expressed great concern that, even at a conservative estimate of 16 500 to 26 800 seabirds, the level of seabird by-catch in the unregulated fishery for *D. eleginoides* in Subareas 58.6/58.7 (and probably also in Divisions 58.5.1 and 58.5.2) in the 1996/97 split year was at least 20-times greater than that for the regulated fishery."[329] These values assume a by-catch rate in the unregulated fishery is the same as in the regulated fishery, a conservative assumption. Alternate calculations that assume the by-catch in the unregulated fishery is at the highest observed rate gave estimates of by-catch of 66,000 to 107,000 seabirds.[330] The impact on white-chinned petrels and albatrosses was considered entirely unsustainable.[331]

In 1998 the Scientific Committee advised the Commission that there had been a substantial reduction in seabird by-catch in the regulated fisheries in the Convention Area in 1997/98. This was in part attributable to greater compliance with Conservation Measure 29/XVI.[332]

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[323] CCAMLR-XIV, pp.38-39.
[324] CCAMLR-XVI, 6.34, p.17. This does not seem to have had much impact on the companies involved with IUU fishing.
[325] CCAMLR-XVI, 6.39, p.17.
[326] CCAMLR-XVI, 5.22, p.10.
[327] CCAMLR-XVI, 6.40, p.18.
[328] CCAMLR-XVI, 6.42, p.18.
[329] CCAMLR-XVI, 6.52, p.19.
[330] CCAMLR-XVI, 6.53, p.19.
[331] CCAMLR-XVI, 6.52, p.19.
[332] CCAMLR-XVII, 6.19, p.26.

Chile noted that for conservation measures to be effective their implementation requires cost-effective strategies.[333] Estimates for seabird by-catch from unregulated fishing in the Convention Area remained similar to 1997, about 50,000 to 89,000 seabirds. These levels of by-catch are about two orders of magnitude greater than in the regulated fishery and are unsustainable for the albatross, giant petrel, and white-chinned petrel populations concerned.[334] SCOI noted that IUU vessels often set aside their fishing gear to avoid sighting or detection, which can result in ghost fishing and seabird mortality.[335]

Conservation Measure 29/XVI was retained, but varied for New Zealand fisheries in Subarea 88.1 south of 65°South latitude.[336] This was done because night setting was not possible at that latitude, and because it was believed at that time that observations had shown that there were no birds present in the area.[337] The strategic advice from the Scientific Committee was that sustained development of underwater setting offered the most likely medium to long-term solution to the problem. In the short-term work on line weighting regimes to ensure fast sink rates is best.[338] Other advice concerned training and education, and the development of national and international plans of action.[339] New Zealand expected to have a seabird identification guide ready early in 1999. Brazil had translated the CCAMLR booklet *Fish the Sea Not the Sky* into Portuguese.

In 1999, it was noted that with the prohibition of net monitor cables in the Convention Area after Conservation Measure 30/X, very few cases of incidental mortality have been reported from trawl fisheries.[340] Advice from the Scientific Committee was that compliance with some elements of Conservation Measure 29/XVI remained very low, especially line weighting.[341] The Scientific Committee concluded that there were substantial reductions in seabird by-catch in the longline fishery. The trend has been

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[333] CCAMLR-XVII, 6.21, p.27.
[334] CCAMLR-XVII, 6.22, p.27.
[335] CCAMLR-XVII, Annex 5, 2.4, p.3.
[336] CCAMLR-XVII, 6.30, p.28. New Zealand applied for an exemption from the night-setting requirement as this would greatly restrict the time of year when fishing can be undertaken at that latitude. CCAMLR-XVII, 9.8, p.36.
[337] Subsequent observations have indicated the presence of birds. Personal notes, Felicity Wong GCAS Lecture, 12 January 2001.
[338] CCAMLR-XVII, 6.31, p.28.
[339] CCAMLR-XVII, 6.32, p.28.
[340] CCAMLR-XVIII, 6.10, p.23.
[341] CCAMLR-XVIII, 8.5, p.30.

evident for three years and is directly attributable to improved compliance with Conservation Measure 29/XVI. The Commission concluded:

> that significant progress had been achieved by CCAMLR Members in the reduction of seabird by-catch during longline fishing in the Convention Area. If IUU fishing in the Convention Area were to be eliminated, seabird by-catch in longline fisheries in CCAMLR waters would practically stop.[342]

The problem of by-catch might persist in the waters north of the Convention Area, where some vulnerable seabirds range.[343] This requires a concentrated international effort, and continued experimenting with underwater line-setting devices. CCAMLR and the National Museum of New Zealand had published a book, *Identification of Seabirds of the Southern Ocean: A Guide for Scientific Observers Aboard Fishing Vessels*, to help observers.

In 2000, IMALF reported that estimates of seabird mortality due to longlining have increased slightly, despite the combined efforts of CCAMLR members, industry, and NGOs.[344] A report suggested that between 237,000 and 333,000 birds had died within the last four years on longline hooks.[345] Australian scientists and fishers have been working on developing a new chute for delivering baited longline hooks sufficiently deep underwater so as to be undetectable and unreachable by diving seabirds.[346] If successful this device would be attractive to the fishing industry as it allows daylight line setting, combining environmental benefits with efficiency gains. Conservation Measure 29/XVI was amended and adopted as Conservation Measure 29/XIX, and a different option for line weighting was introduced. Vessels that lack the capacity to retain offal on board, or to discharge it on the side opposite to where longlines are hauled, are now not to be authorised to fish in the Convention Area.

Incidental mortality summary

While CCAMLR has enjoyed moderate success in reducing some of the effects of by-catch, the effect of IUU fishing activities on by-catch mean that it remains a serious issue.

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[342] CCAMLR-XVIII, 6.14, p.23.
[343] CCAMLR-XVIII, 6.15, pp.23-24.
[344] "Fishing the Seas and the Skies", *ECO*, 2, 26 October 2000, CCAMLR-XIX, Hobart Tasmania, http://www.asoc.org/ECO2.htm (site visited 27 March, 2001).
[345] "New Zealand has to Share Ross Sea Fishery", *The Press*, Christchurch, Saturday, November 4, 2000, p.3.

Incidental mortality tests the concept of rational use through the damage caused by fishing activities to non-targeted species. CCAMLR has enjoyed a measure of success in reducing incidental mortality within the fishing operations conducted by the portion of the industry complying with CCAMLR regulations. This has been possible in part because technical solutions to the problem, such as changing the kind of equipment used on the fishing vessels, have been relatively effective and acceptable to the fishing operators. The albatross may have captured the limelight of the by-catch issue, but the Commission has also worked quietly to deal with the by-catch problems of other marine species. As Kock put it: "CCAMLR's prompt action in developing and implementing methods to reduce albatross mortality, coupled with the willingness of many fishing masters to cooperate with scientific observers, has done much to alleviate the problem within the regulated fishery until even more effective long-term solutions ... can be tested and implemented".[347] At the moment however the seabirds being saved by CCAMLR measures may only survive to fall victim to the IUU fishing vessels that make no attempt to reduce incidental mortality. The key to reducing incidental mortality to acceptable levels that are sustainable for the affected species will be for CCAMLR to gain effective control over the fishing in the Southern Ocean.

Problems Preventing Effective Conservation Measures in the Southern Ocean

Three themes emerge from an analysis of the material available about recent CCAMLR meetings and why they have been unable to implement effective conservation measures to deal with the problem of IUU fishing in the Southern Ocean. Predictably one of these themes involves the ongoing problems with sovereignty disputes. A second theme is the difficult balancing act the Commission is attempting in allowing a legal fishing industry to continue operating, despite calls for a moratorium. What has been surprising is the role played by the EC in blocking effective conservation measures that would deal with the problem of fishing by nationals of CCAMLR members.

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[346] "Albatross-Safe Longline Closer to Reality", 4 July 2000, http://www.isofish.org.au/news/00/news.00.AlbatrossSafeLonglinecCloserToReality.htm (site visited 27 March 2001).

[347] Karl-Hermann Kock, op. cit., p.26.

The problem posed by the European Community

From the mid-1990s the role of the European Community (EC) in CCAMLR has favoured fishing interests over conservation. This can be seen in part through the changes to the composition of the EC delegation. From 1996 the EC delegation at the meeting of the CCAMLR Commission has been headed by a representative from Directorate-General (DG) XIV (Fisheries) of the European Commission, and the advisers have largely been drawn from fisheries and agricultural organisations in the European Union (EU). At earlier meetings the then European Economic Community (EEC) delegates were drawn more from scientific organisations or the delegation to Australia and New Zealand. The other part of the change has been a noticeable increase in the advocacy of fishing interests by the EC delegation, sometimes at the expense of the conservation objectives of the Convention. The European Commission is present at CCAMLR because members of the EU have delegated their competency in fishing policy to it.

In 1998 New Zealand found that "the role of the EC as a 'bloc' or caucus within the Commission continued to cause concern. It appeared that representatives from EU parties were prevented from intervening in discussions which went beyond matters falling within the competence of the Community."[348] The EC also stalled for time when it appeared to have difficulties reaching an agreed position. France and the UK have not delegated competency on fisheries issues to the EC for their sub-Antarctic islands, and they were not prevented from making statements in the Commission. The crux of the matter is that an EU member can block progress in CCAMLR for more effective conservation measures by dominating the European Commission policy agenda. The opinions of those members who support conservation is then stifled by the need for the EU to present a united common policy at the Commission meeting. It also means that an EU member that opposes conservation measures does not have to openly identify its opposition to the measure, it can do so behind closed doors. This subverts the consensus decision-making procedure that CCAMLR should use.[349] Alan Hemmings, the ASOC representative in SCOI at

[348] *Commission for the Convention for the Conservation of Antarctic Marine Living Resources, CCAMLR XVII: Hobart, 26 October – 6 November 1998, Report of the New Zealand Delegation*, Antarctic Policy Unit: Wellington, November 1998, p.19.
[349] See Chapter 4, pp.122-127.

CCAMLR-XIX found that it was: "not edifying to see the EU subverting liberal principles to support large fishing companies."[350]

At CCAMLR XIX the EU blocked the proposal from Norway to strengthen Conservation Measure 118/XVII (Scheme to promote compliance by non-contracting party vessels). ECO reported that the proposal would have added language that would deny the right to fly the flag of Contracting Parties or to be given a license to fish in areas under members' fisheries jurisdiction, if the vessel involved had been prohibited from landing or transhipping fish.[351] This proposal was in line with the unilateral action taken by Norway that involves blacklisting IUU vessels from ever fishing again in Norwegian waters – irrespective of who currently owns the vessel.[352] The EC Representative complained about this revelation, deploying the term "transparency" to characterise the opposite, but as ECO pointed out "The EU has not denied the substance of the article – it could hardly do that given common knowledge in Brussels and the corridors here in Hobart that it is so."[353]

One complication here is that the European Commission represents states that are not members of CCAMLR, such as Portugal, that have been active in the Southern Ocean. In 1999 the EC reminded the Commission that EU member states had transferred to the European Commission their competence on fisheries, entitling and obliging the European Commission to regulate the internal or external fishing activities of its members.[354] As a consequence of this all member states of the EU are bound by CCAMLR conservation measures, irrespective of whether or not they are Members of CCAMLR.[355] However, "the majority of the Members of the Commission took the position that any fishing by a Portuguese-flagged vessel would be in contravention of the Convention unless Portugal had acceded to the Convention prior to the initiation of such activities."[356] The EC "fully reserved" its rights under the Convention in relation to EC vessels.[357] Argentina, New Zealand, Chile, Australia, Russia, and South Africa all expressed their reservations.[358]

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[350] Interview with Alan Hemmings, 22 November, 2000.
[351] "European Community Blocks Norwegian Proposal", *ECO*, 2, 26 October 2000, CCAMLR-XIX, Hobart Tasmania, http://www.asoc.org/ECO2.htm (site visited 27 March 2001).
[352] This approach is ineffective against vessels with a low capital value (or 'rust-buckets').
[353] "Seeing Through the EU", *ECO*, 3, 30 October 2000, CCAMLR-XIX, Hobart Tasmania, http://www.asoc.org/eco3.htm (site visited 27 March 2001).
[354] CCAMLR-XVIII, 9.42, p.39.
[355] CCAMLR-XVIII, 9.43, p.40.
[356] CCAMLR-XVIII, 9.44, p.40.
[357] CCAMLR-XVIII, 9.45, p.40.
[358] CCAMLR-XVIII, 9.47-9.52, p.40.

Chile made the statement that "Only Flag States can take on these obligations in the legal and political context of the Antarctic Treaty System and all obligations pertaining to CCAMLR that are not within the scope of the fisheries and the environment."[359] The Commission called on Portugal to consider early accession to the Convention.[360] Portugal had not joined CCAMLR by 2000 and had also not ceded competency to the EU for flagging vessels. "The EU was thus found to be in the extraordinary position of encouraging a Portuguese vessel to engage in IUU fishing in CCAMLR waters."[361]

The problem is that the European Commission is currently biased towards exploitation over conservation in this issue area. A New Zealand report noted that the "EC experience appeared also to reflect some of the tensions that have emerged in the relationship between the Antarctic Treaty System and CCAMLR when the latter is treated principally as a fisheries management regime unconnected to the Treaty regime from which it sprang."[362] As with the ATCPs finding it important to maintain consensus when dealing with criticism of the ATS from third parties, the members of the EU also find it important to maintain their common policy in an issue area. Mark Kurlansky's opinion of the European common fishing policy (CFP) was that "Politics and nationalism often play far greater roles than conservation in the decision-making process."[363] The CFP has included the concepts of the ecosystem and precautionary approaches since 1997.[364] However DG-XIV appears to play the main role in the formulation of policy for the European Commission in respect of CCAMLR, without much consultation to the Environment DG.

The problem posed by the European Commission behaviour in the CCAMLR Commission is not one that the other members of the Convention can do much about to directly influence the EU. For change to occur here there will first have to be change in the domestic institutions of the EU and the EU members. In this respect the actions of environmental NGOs may have a positive contribution to make about awareness of the environmental problems of Antarctica and the Southern Ocean in the northern hemisphere.

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[359] CCAMLR-XVIII, 9.49, p.40.
[360] CCAMLR-XVIII, 9.46, p.40.
[361] "Portugal Triage", *ECO*, 1, 23 October, CCAMLR-XIX, Hobart, Tasmania, http://www.asoc.org/ECO1.htm (site visited 27 March 2001).
[362] *New Zealand Delegation, Commission for the Convention for the Conservation of Antarctic Marine Living Resources: CCAMLR-XVII, Hobart, 26 October – 6 November, 1998*, Antarctic Policy Unit: Wellington, 1998, p.20.
[363] Mark Kurlansky, op. cit, p.210.

Public pressure can influence the 'horse-trading' that is a feature of negotiations within the EU over policy. It would be interesting to see what stance the EC would take at CCAMLR if the representatives in its delegation included members of the Environment DG. Proposals originating from the EU that would reduce the transparency of the actions of its members, such as grouping the catch data of EC members into one category, are probably best opposed by the other members.

The problem of sovereignty disputes and conservation measures

Despite the compromises in the Antarctic Treaty and the Convention in relation to territorial disputes, sovereignty issues remain in the background of every political debate within the ATS.[365] The issue of compatibility and harmonisation between national measures in EEZ jurisdiction, and CCAMLR measures for the entire Convention Area, has constantly proven a divisive issue within the Commission. Discussion on new conservation measures is often interrupted as different members attempt to preserve their different positions on outstanding sovereignty issues, such as coastal state, flag state, and port state responsibilities. IUU fishing complicates this stress point through jurisdictional issues relating to EEZ, especially in Subarea 48.3 between Argentina and the UK.

In 1996 consideration of the implementation of the objective of the Convention caused an extensive discussion of sovereignty issues.[366] Chile found the "spirit of cooperation is no longer evident, as the national interest appears to dominate, thus obstructing the work of the Commission."[367] The United States pointed out that "CCAMLR is currently dealing with issues not anticipated when the Convention was negotiated."[368] Argentina outlined an interpretation of the Chairman's Statement of 1980 that it would only apply where state sovereignty exists and is recognised by all contracting parties.[369] Argentina believed that cooperation was at risk due to unilateral actions by the UK in South Georgia and the South Sandwich Islands (Subareas 48.3 and 48.4). The UK rejected this interpretation of the

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[364] http://europa.eu.int/comm/fisheries/doc_et_publ/factsheets/facts/en/pcp8_1.htm (site visited 27 March 2001).
[365] New Zealand negotiations for a tax treaty with Japan stalled for ten years because of the New Zealand claim to the Ross Dependency. Personal Notes, Felicity Wong, GCAS Lecture, 13 January 2000.
[366] CCAMLR-XV, 12.1-13.41, pp.78-88.
[367] CCAMLR-XV, 12.4, pp.78-79.
[368] CCAMLR-XV, 12.14, p.80.
[369] CCAMLR-XV, 13.2, p.82.

Chairman's Statement.[370] The Commission recognised that it was not the most appropriate forum to resolve these differences, and encouraged Argentina and the UK to continue bilateral discussions, and the hope was expressed that the dispute will not affect CCAMLR cooperation.[371] In 1997 the arguments about this difference in interpretation emerged again in consideration of VMS.[372] In 1998 the UK and Argentina reiterated their reservations from CCAMLR-XVI.[373]

In 1999 there was an argument of whether or not regulatory action by the UK to help deal with the IUU problem was in accordance with the objectives of the Convention. The use of unilateral measures by the UK, which could be seen to reinforce its claims, was upsetting to Argentina and Chile. There was an extensive argument over a footnote in a Chilean paper concerning South Georgia and the South Sandwich Islands.[374] While Chile acknowledged UK 'control' over the territory, it does not recognise UK 'sovereignty'. The UK was concerned that the footnote challenged the applicability of the 1980 Chairman's Statement to South Georgia and the South Sandwich Islands. The UK made several points, *inter alia*: that the territory concerned was not a dependency of the Falkland Islands; that the 200 mile Maritime Zone around South Georgia and South Sandwich Islands extends south of 60°South latitude, but the fishery legislation for the Zone does not; and their efforts are in the 'spirit' of the Convention as they contribute towards a sustainable fishery. Argentina rejected the points made by the UK. This was frustrating for the other delegates as discussion of the Falkland/Malvinas Island problems are unlikely to be conducive to the work of CCAMLR.[375] One practical impact of this dispute is that the UK finds it difficult to carry out inspections on Argentine vessels in the Convention Area.[376]

Elsewhere in the Southern Ocean where territorial sovereignty has been undisputed there have been fewer problems and more flexibility demonstrated on the parts of the CCAMLR Members with jurisdiction in the Southern Ocean. Australia sought assistance in informing

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[370] CCAMLR-XV, 13.16, p.84.
[371] CCAMLR-XV, 13.41, p.88.
[372] CCAMLR-XVI, 9.59-9.66, pp.35-36. See also p.206 above.
[373] CCAMLR-XVII, 9.57-9.58, p.43.
[374] CCAMLR-XVIII, 13.1-13.13, pp.50-55, and 17.1-17.3, pp.56-57.
[375] CCAMLR-XVIII, 13.4, p.52. The UK made a point of this: "our time is limited and would be better spent tackling the immediate and increasing menace of poaching ... rather than in unproductive exchanges on a matter which is all too well known to us all."
[376] In the 1999/2000 Season three Argentinian vessels refused to stop or otherwise facilitate a UK-designated CCAMLR inspector. *Report of Members' Activities in the Convention Area in 1999/2000*, United Kingdom.

people about the controls implemented in the Australian EEZ and Heard and MacDonald Islands. Australian legislation had been amended to increase penalties for illegal fishing, including the immediate forfeiture of foreign vessels found engaged in illegal fishing.[377] South Africa indicated its willingness to include its EEZ around the Prince Edward Islands in CCALR measures to regulate new fisheries there.[378] What the unresolved sovereignty problems mean for the future effectiveness of CCAMLR is that while the compromises that prevent conflict there can not be changed, it is also more difficult to change the other original assumptions, principles, and norms of the CCAMLR regime. Not a lot can be done about territorial sovereignty without revisiting the original compromises in the Antarctic Treaty, something that most ATCPs will be reluctant to do. The best hope is for improved long term relations between the CCAMLR members with overlapping and disputed claims.

The problem of maintaining a legal fishery

The continuation of a legal fishery for toothfish has been an issue rising up the environmental agenda since 1997. Rational use of the resources of the Southern Ocean strongly implies that a fishing industry should be permitted in CCAMLR waters, and the traditional interpretation has been to permit fishing to continue until after it has been demonstrated that the conservation goal is not being met. This has been criticised by the environmental NGOs and they have adopted a policy calling for a moratorium on the continuation of fishing for toothfish. This highlights the tension that the concept of rational use has between the exploitation and conservation objectives of the Convention.

One argument made in favour of continued legal fishing is that it will help to deter IUU fishing. In 1997 South Africa expressed a view that "the presence of responsible and regulated fisheries would serve the conservative objectives of the Convention, not only by acting as a source of essential information, but also as a physical deterrent to unregulated fishing, particularly in the waters around the Prince Edward and Crozet Islands."[379] This can happen because vessels tend to find each other at sea and gravitate together due to radio contact, the vagaries of weather, and fishing conditions.[380] It would not be equitable

[377] CCAMLR-XVIII, 9.58, p.41.
[378] CCAMLR-XV, 8.18, p.35.
[379] CCAMLR-XVI, 7.21, p.23.
[380] Personal Notes, CCAMLR Consultative Meeting, Ministry of Foreign Affairs and Trade, Wellington, 26 September 1999.

for the compliant fishers to be penalised for the actions of the IUU fishers. "New Zealand believed that the Commission must pay proper attention to the needs of legitimate fishing industry – those companies which were prepared to abide by the rules and conservation measures needed to be recognised."[381]

Some members questioned this view on the grounds that extending legitimate fishing operations could increase the by-catch of sea-birds. Other members responded by pointing out that by-catch in the unregulated fishery was two orders magnitude greater than that in the regulated fishery.[382] In 1998 some Members proposed that year-round longline fishing was required to effectively monitor unregulated fishing, but this was not accepted.[383] Another problem caused by IUU fishing is the interference in assigning precautionary limits. Catch limit recommendations for the regulated industry could be mistakenly based on the assumption that IUU activities would cease in the next season.[384] The Scientific Committee has difficulty in reconciling decision rules where the indicators were in conflict.[385] It does not help the situation that exploitation is occurring when there is a lack of reliable estimates for the biomass of the toothfish stocks in the different areas of the Southern Ocean. For example, in 1998 Norway asked how the Commission could reconcile the views of the Scientific Committee regarding the setting of catch limits and the grave threats brought about by IUU fishing.[386] The 'catch-22' for CCAMLR is that it needs research information that can only be acquired by observers on fishing vessels. By continuing to explore for new fisheries, and then making that information public, CCAMLR is potentially giving the 'pirates' the information they need about where to go fishing next. At CCAMLR-XIX ECO observed that year-round fisheries do not seem to deter IUU fishing; only military coverage seems to do so.[387]

At the same time large catch limits are being allocated for *E. carlsbergi*, for example Conservation Measure 155/XVII for the 1998/99 season with a TAC of 109,000 tonnes.[388] Yet this species is not being harvested, presumably because there is little money to be

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[381] CCAMLR-XVI, 5.14, p.10. This sentiment was supported by Australia, South Africa, France, Russia, Chile and Ukraine. CCAMLR-XVI, 5.26, p.11.
[382] CCAMLR-XVI, 5.27, p.11.
[383] CCAMLR-XVII, 9.10, p.36.
[384] CCAMLR-XVI, 7.16, p.23.
[385] CCAMLR-XVI, 4.14, p.5.
[386] CCAMLR-XVII, 7.22, p.31.
[387] "Year-Round Bird By-Catch?", *ECO*, 3, 30 October 2000, CCAMLR-XIX, Hobart Tasmania, http://www.asoc.org/eco3.htm (site visited 7 November 2000). See Chapter 5 n408, p.228.

made. Legitimate fishing companies want a sustainable fishing industry that they can participate in over the long term. In the short term they have to remain profitable as well. Given the doubts about the adequacy of the stock assessments for toothfish it seems doubtful that a precautionary approach has been applied in many areas in the Southern Ocean. While legal fishing continues it shrouds illegal fishing, and while the legal fishing continues it is difficult for trade based conservation measures to close markets to illegal fish.[389]

The moratorium proposal

Environmental NGOs are now advocating for a moratorium on toothfish harvesting and have criticised the continued presence of legal fishing. In 1997 the ASOC Observer expressed concern:

> that economic pressures for increased quotas and burgeoning illegal and unregulated catch of *D. eleginoides* threaten the Southern Ocean ecosystem and more broadly the international credibility of CCAMLR. Until illegal and unregulated fishing is brought under control, ASOC believes that Members have no choice but to set zero TACs. It believes that it makes no sense at all to be conducting 'legal' fishing when the real catch is already so far above what CCAMLR estimates as a precautionary level, and allowing any fishing while this situation is out of control only compounds the depletion.[390]

A similar statement was made in 1998,[391] and ASOC called for a 'zero' catch limit for *Dissostichus* spp.[392] A 'zero' catch limit was rejected by the Members on the grounds that: catch limits took into account the best available data; more stringent conservation measures would be passed at the meeting; and the implementation of these measures would tackle the IUU problem effectively without adversely affecting legitimate fishing.[393]

The calls for an actual moratorium began in 1999 and were linked with the call for a CITES listing in 2000. The proposed moratorium is not intended as a ban. Greenpeace believes that a moratorium should be declared and enforced: "until the IUU fishery has been driven out, the remaining Toothfish stocks assessed for their ecological ability to

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[388] CCAMLR-XVII, 9.37, p.40.
[389] Personal notes, Alistair Graham Lecture, 22 June 2000.
[390] CCAMLR-XVI, 12.9, p.74.
[391] CCAMLR-XVII, 12.17, p.84.
[392] CCAMLR-XVII, 12.18, p.84.
[393] CCAMLR-XVII, 12.18, p.84.

support a commercial fishery, and regulations are in place to adequately manage 'resumed' fisheries."[394] In addition to this the NGOs believe that science, and not pressure from the fishing industry, should be the deciding factors in reopening the fishery. This stock assessment will require more funding for research, which will probably have to come from member governments rather than commercial sources. The NGOs would also like to see the moratorium supported with an international trade ban under CITES in 2002. Trade related measures are strengthened by the ban, as toothfish being landed can be presumed to have been caught in IUU fishing. Another NGO goal for when fishing does occur is that there should be a zero by-catch for seabirds.

A variety of motives have prompted the call from the environmental NGOs for a moratorium. There is an expectation that the Patagonian toothfish will become commercially extinct in the near future. The high level of by-catch of seabirds in the IUU industry, combined with the ineffectiveness of current conservation measures to halt IUU, is another source of great concern. A moratorium may be the only way to curb the interest of the legitimate fishing industry in expanding the toothfish fisheries in the Southern Ocean. This is significant because of the growing commercial pressure on member states to open new and exploratory fisheries, and to retain access to existing fisheries. The interpretation placed on rational use by the environmental NGOs places much greater weight on the conservation objectives of the CCAMLR regime, than the exploitation expectations of fishing nations. Part of the ASOC approach has been a values based argument that the Southern Ocean should be treated differently:

> It is not fair that the legal fishery also has to pay the price of illegal fishing in the Southern Ocean. But Antarctica and its surrounding ocean is a rare and special place, one that the member countries of the Antarctic Treaty System promised the international community it would strive to protect. This is not just another fishery where commercial interests and officials can argue about access, ownership and certainty.[395]

It was also argued that CCAMLR is not just another fisheries convention; it is a conservation agreement that is an integral part of the ATS. The core values of peace and cooperation were implicit in the precautionary management approach and are at risk from

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[394] Greenpeace New Zealand, "Patagonian Toothfish", Greenpeace Briefing, 2000.
[395] "Precautionary Approach – Moratorium on Toothfish Fisheries the Only Option", *ECO*, 1, CCAMLR XVIII, 25 October, 1999, Hobart, Tasmania. http://www.asoc.org/currentpress/ecodoc.htm (site visited 27 March 2001).

the pressure of commercial imperatives.[396] Environmental groups are deliberately using the 'albatross factor' to gain political attention. This is because everyone understands that extinction is bad. It has also been argued that the Antarctic toothfish in the Ross Sea region can not be sustainably managed because they grow too slowly.[397]

The calls for a moratorium are not supported by the fishing industry. One argument made against the call for a moratorium is that it will remove a potential source of surveillance of IUU fishing. As Alistair Macfarlane of the New Zealand Seafood Industry Council put it: "It's ironic that an environmental group is pushing for the moratorium knowing full well it would be a green light for uncontrolled illegal fishing on a grand scale".[398] In New Zealand the fishing industry has claimed that the toothfish stocks are good in the Ross Sea region,[399] and that they can be sustainably managed.[400] If it could be scientifically demonstrated that fishing for Antarctic toothfish can not be done on a sustainable basis, then a moratorium would become a ban, as rational use of the resource can not be justified if it will cause an irreversible decline in the stock. For the moment however, the idea of rational use still supports the claims of the fishing industry for access to toothfish stocks. It is also questionable if a zero by-catch goal for seabirds is biologically necessary. The current "best practice" is the 'three strikes' policy for the Ross Sea required of New Zealand operators, where three sea-bird deaths result in the cessation of the fishery.

The moratorium proposal requires that a CCAMLR member adopt and advocate it, otherwise the routines of CCAMLR are unlikely to change. New Zealand announced in July 2000 that it would advocate for a global moratorium on fishing for toothfish if protection under the current licensed fishing programme proves inadequate.[401] This followed intense domestic lobbying between environmental and fishing industry lobby

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[396] "CCAMLR: Not Just Another Fisheries Convention", *ECO*, 1, CCAMLR XVIII, 25 October, 1999, Hobart, Tasmania. http://www.asoc.org/currentpress/ecodoc.htm (site visited 27 March 2001).
[397] Personal notes, Alistair Graham Lecture, 22 June 2000.
[398] "Saving Antarctica's 'White-Gold", *Antarctic: the Journal of the New Zealand Antarctic Society*, 17 (4), 2000, p.81.
[399] "Toothfish Stocks Good – Sanford", *The Press*, Christchurch, Friday, July 14, 2000, p.3. "Mr Barret said the SS Fishing joint-venture was 'pretty sure' that the Ross Sea area of Antarctica held a good stock of toothfish which could support a commercial fishery."
[400] "Wake-up Call Over Toothsome Fish", *The New Zealand Herald Online*, 14 July, 2000. According to Eric Barret "four years of research had proved that the toothfish resource was strong enough to be fished at four or five times its present rate."
[401] Hon Phil Goff, "Ross Sea Toothfish", 18 July 2000, http://www.executive.govt.nz/speech.cfm?speechralph=31674&SR=0 (site visited 27 March 2001).

groups.[402] At CCAMLR-XIX New Zealand gave notice that if the trend continued it would call for a global moratorium backed by international trade restrictions through CITES.[403] A unilateral moratorium by New Zealand government is unlikely to be effective as vessels from other nations could apply to fish in the Ross Sea. Despite this policy shift New Zealand can be seen as ambivalent rather than primarily conservationist in its policy – because its Ross Sea lobbying is linked to the territorial interest that it has in Antarctica. The United States has been a source of conservationist leadership within CCAMLR in the past, but if the United States fishing industry becomes involved in Southern Ocean fishing then its leadership role could change.[404]

The great weakness of the moratorium proposal, is that just like CCAMLR conservation measures, it requires compliance from all those participating in the toothfish industry to be successful. CCAMLR can only regulate its own members, so the third-party and high seas problems would remain. A moratorium might strengthen the reputational effects and social opprobrium of continuing in the toothfish trade, but as long as the economic incentives remain high the IUU trade may persist. The environmental groups realise that a moratorium by itself is not a complete answer to the IUU problem.[405] To complement the moratorium they are also calling for mandatory VMS implementation to allow governments to track illegal vessels, and denial of non-emergency port access to fishing vessels without VMS and proof of legal fishing.[406]

A repeat of CRAMRA, where a resource exploitation regime is replaced by a stricter conservation regime, is unlikely.[407] When CRAMRA was being negotiated exploitation had not occurred and it was discarded before it could enter into force. CCAMLR has already been negotiated and ratified, and the living resources of the Southern Ocean are being exploited. The pressures for commercial exploitation are going to increase, not abate

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[402] "Wake-up Call Over Toothsome Fish", *The New Zealand Herald Online*, 14 July 2000.
[403] "The Moratorium Discussion Begins", *ECO*, 4, 2 November 2000, CCAMLR-XIX, Hobart Tasmania, http://www.asoc.org/ECO4.htm (site visited 27 March 2001).
[404] Alan Hemmings Interview, 22 November, 2000.
[405] Greenpeace New Zealand, "Pirates Plunder Southern Ocean", Greenpeace Briefing, 2000, "There is no one simple solution to illegal fishing, and the challenges presented by the vastness and remoteness of the Southern Ocean are daunting. However these challenges can and must be met, and CCAMLR must embrace a suite of measures to ensure that fishing can continue in this region on a sustainable and precautionary basis."
[406] Greenpeace New Zealand, "CCAMLR: The Convention for the Conservation of Antarctic Marine Living Resources", Greenpeace Briefing, 2000.
[407] See Chapter 3, pp.77-78.

in the future. The way in which domestic politics unfolds over this issue in the member states will be crucial as to whether or not CCAMLR will redefine 'rational use' so that it includes a greater willingness avoid abuse the living marine resources of the Southern Ocean. At CCAMLR-XIX the members appear to have accepted that the deterrent effect of legal fishing vessels is minimal and that only military vessels are an effective deterrent.[408] This appears to undermine one element of the arguments used by the legitimate fishing operators to maintain their access to the fisheries of the Southern Ocean.

Assessment of CCAMLR and the IUU Fishing Problems

CCAMLR should not just be assessed as a conservation-fisheries regime. It should also be assessed as a conservation-fisheries regime operating within the ATS regime. CCAMLR has in many ways been a strategic success for the ATS. In the 1980s it helped preserve the authority of the ATCPs over Antarctica and the Southern Ocean. The negotiation and entry into force of the Convention was a successful expansion of the ATS that reduced the chances of commercial exploitation of living marine resources putting too much stress on the sovereignty compromise of the Antarctic Treaty. The cautious assessment by Zegers in 1983 found that the Convention was important, but "these positive effects could be reversed if the Convention does not prove to be effective."[409] If CCAMLR is an operational failure as far as conservation goals are concerned, then eventually the fishing goals will be compromised as well. If CCAMLR is ineffective and breaks down then there could be a reduction in the strength of the ATS, and a resurgence of territorial sovereignty issues. This possibility has been present since the start of the Convention because CCAMLR members were unwilling to yield sovereignty or real control over the Southern Ocean, as Barnes put it: "the limited scope of the Convention fosters the strong possibility of an unstable situation in the future, which could jeopardize the Convention and put additional pressure on the Antarctic Treaty itself."[410]

In looking at how effective CCAMLR has been in achieving its conservation goals, one question is whether or not CCAMLR is managing the Southern Ocean as an ecosystem, or

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[408] Personal correspondence from Felicity Wong, 18 December 2000. See Chapter 5, note 387, p.223.
[409] Fernando Zegers, op. cit., p.156.
[410] James N. Barnes, op. cit., p.274.

if it is still taking a piecemeal species-by-species approaches. Howard in 1989 thought that after five years of operation that the CCAMLR regime could be evaluated for its degree of success in implementing the ecosystem approach.[411] At that time some of the members were dissatisfied with the progress made towards implementing conservation measures and a drift away from an ecosystem approach to a single species approach. Papers containing strong statements were progressively weakened in an attempt to gain consensus.[412] Howard did not think that the blame could be placed on the requirement for consensus voting as there were areas in which conservation leadership could have been exercised independently, such as research, ecosystem monitoring, and *ad hoc* observation. What was required was a greater commitment to the conservation objective by the members of CCAMLR.[413]

If the early writings about CCAMLR are a mixture of optimism and pessimism in the assessments of its effectiveness, by the early 1990s most such assessments were more optimistic. "The Convention seems to have protected the fish population of the Antarctic from spiralling overexploitation."[414] The conclusions of most writers on CCAMLR echo the same themes, that despite the early problems there has been a steady if slow improvement in the regime, and that it is now better positioned to deal with problems in the future. In 1994 Kock wrote that "economic considerations and market demands will be the primary determinants of the future development of fisheries in the southern waters."[415] The three fisheries that appeared economically viable to Kock at that time were the longline fishery on the Patagonian toothfish, part of the krill fishery, and the trawl fishery on mackerel icefish. Since then the toothfish fishery has developed out of the control of CCAMLR as a result of the IUU fishing activities. Other finfish fisheries have not seen a renewed interest in exploitation yet, and interest in the krill fishery has remained relatively constant, but with some signs of increasing interest from new operators. Long term trends in the wider context of world fisheries may affect the economics of the situation as well,

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[411] Matthew Howard, p.135.
[412] ibid., pp.135-137.
[413] ibid., pp.148-149. "it is clear that the Convention has not been faithfully pursued .... when one attempts to explain why the Convention has not been implemented one reason is dominant – the conservation objective and principles of the Convention are secondary to members of the CCAMLR regime; of primary importance to them are their own national interests."
[414] Jean-Pierre Puissochet, op. cit., p.76.
[415] Karl-Hermann Kock, "Fishing and Conservation in Southern Waters", *Polar Record*, 30 (172), 1994, p.15.

but at the moment there is a continued demand for toothfish, giving it a high market value that continues to attract poaching.

In the wake of the IUU fishing shock and the associated problem of sea-bird by-catch a new assessment of the performance of the CCAMLR regime can now be drawn. While there has been an improvement in the regime in relation to these issues it has come at a slow pace. As a response mechanism to overexploitation of the living resources in the Southern Ocean this has proved too slow. As the CCAMLR regime approaches the end of its second decade of operation it appears incomplete and unable to prevent significant damage to the ecosystem of the Southern Ocean that it has assumed responsibility for. Heap and Edwards once wrote that "If it does not give effect to the 'objectives and principles' the Commission will be failing in its function."[416] At some stage CCAMLR will have to attain the capacity to achieve its conservation objectives in the immediate present, rather than hoping to achieve them in the future, or else it will have to be judged a failure.

The traditional delaying tactics of the fishing members may have worked against their own interests as well as those of the conservation objectives of the Convention. The slow response has meant that toothfish stocks have been rendered commercially extinct in some fishing grounds, rather than being developed for rational use. This can in part be attributed to a reluctance from the fishing states that precautionary measures should be placed on fisheries, or that enforcement measures were necessary, before the IUU problem manifested itself. Enforcement efforts in the Southern Ocean have increased, but IUU fishing persists. 1998 was perhaps the earliest opportunity for VMS and a CDS to be introduced by CCAMLR. So far the results of the 1999 CDS scheme leaves much to be desired, and the VMS does not apply to all the boats in the krill fishery. One development in 2000 may have been the creation of two markets for toothfish; one high value market for documented fish, and a lower value market for IUU fish. One side effect of increased enforcement and control has been the displacement of fishing operations into developing states. This actually reduces the ability of the CCAMLR members to control the problem and adds to the undermining of the credibility of CCAMLR, and consequently also undermining the credibility of the entire ATS regime.

[416] David M. Edwards and John A. Heap, op. cit., p.356.

Victoria Hallum assessed the CCAMLR reaction up to the end of 1997 as not being a comprehensive addressing of the problem and as being unlikely to stem the IUU fishing.[417] The timeline for developing market controls has been too slow due to a lack of political will. "The shadow that falls between the potency of CCAMLR and its existence is a lack of genuine commitment on the part of the Parties to implementing and enforcing its aims. Without this commitment the CCAMLR regime is merely a hollow shell."[418] There is a lack of capacity among some states. "For other States however, the likely cause is more sinister. Those States do not actually *want* to see an improvement in compliance with the regime, because their vessels and their industries are benefiting hugely from the illegal and unregulated fishing."[419] Felicity Wong observed that conservation measures were "negotiated down by the countries involved in the illegal fishing."[420]

Future trends for the CCAMLR regime

CCAMLR will probably continue to leave the whaling issue with the IWC, and seals with CCAS. The current trend in whaling politics is that more pressure is being exerted by the conservationist states to halt scientific whaling in the Southern Ocean. A resumption of commercial whaling seems unlikely. The New Zealand and Australian initiative for a South Pacific whale sanctuary was defeated in 2000, but a resolution criticising 'scientific whaling' in the Southern Ocean was passed.[421] t seems unlikely that there will be any resurgence of commercial interest in seals, so CCAS will remain a dormant regime without any real need for it to be merged with CCAMLR. A resumption of sealing would also be likely to draw protests from environmental NGOs. Fishing effort for crab and squid remains low, although exploratory efforts are continuing. The focus of commercial fishing in the immediate future will remain on finfish and krill.

The recovery of the fishing stocks depleted before CCAMLR entered into force progresses slowly. It is probable that Patagonian toothfish stocks will become commercially extinct in more areas of the Southern Ocean, as has already happened around the Prince Edward and Marion Islands. Fishing for *D. mawsoni* has started on a low level, with no substantial

[417] Victoria Hallum, op. cit., p.63.
[418] ibid., p.64.
[419] ibid. Emphasis in the original.
[420] Personal Notes, Felicity Wong, GCAS Lecture, 13 January 2000.

evidence of IUU fishing targeting the stock at the time of writing. New Zealand companies have been conducting exploratory fisheries in the Ross Sea and are now potentially being joined by vessels from other CCAMLR members. There are questions as to the commercial viability of the Antarctic toothfish,[422] and the environmental NGOs question whether the stock can ever be harvested on a sustainable basis. Unless a major shift in policy occurs CCAMLR appears likely to continue approving new and exploratory fisheries until all toothfish stocks have been discovered and exploited.

Important as the IUU fishing of toothfish is, it pales into insignificance besides the potential impacts of large scale harvesting of krill. "The focus of future exploitation ... is krill, the primary food source of most higher organisms within the ecosystem."[423] Who is likely to get involved in krill fishing in the future? Joyner suggested India and China, but pointed out their lack of a fishing fleet for Antarctic waters.[424] There has been new commercial interest from North America,[425] the EU, and existing interests from the old players in the krill industry: Russia; Korea; Japan. This means that the industry may be rapidly expanded with new and innovative technology, as well as a potential increase in catch effort from increasing the number of vessels involved. Any substantial increase in the krill harvest must have an impact on the ecosystem due to the biological connections between krill and other species and the techniques that will be used for krill harvesting. The fine mesh trawl nets will catch juvenile fish as well as krill, and have a disproportionate effect on the krill predator species. Some predator species, such as Antarctic fur seals, are close to pristine abundance, while others, such as the great baleen whales, are well below their original biomass levels.[426] If krill is heavily exploited then these species are unlikely to recover. In 1996, before IUU fishing was a major problem, Rothwell wrote that: "Given the importance attached to CCAMLR management of krill, the future effectiveness of the regime will be judged against its ability to manage that

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[421] "2000 IWC Meeting and the Southern Ocean", *The Antarctic Project*, 9 (2), August, 2000, http://www.asoc.org/currentpress/augnewlet.htm (site visited 3 November 2000).
[422] "it's not a goldmine, we have not made money to date." Personal Notes, Martin de Beer of Sanford Fisheries, Lecture to GCAS, 12 January 2000.
[423] Christopher C. Joyner, op. cit., p.146.
[424] ibid., p.133.
[425] One vessel operated by Top Ocean Company based in Seattle, Washington, US began fishing for krill in Area 48 on 28 July 2000. There are plans for this to continue with one to two US-flagged vessels. *Report of the United States' Activities in the Convention Area in 1999/2000.*
[426] Karl-Hermann Kock, op. cit., p.16.

resource stock."[427] However, CCAMLR will also be judged by how well it deals with current IUU and by-catch problems. In the future will CCAMLR be an effective conservation agreement; or will it remain a regime that fails to regulate fisheries? Developing a system that harvests the krill effectively after other management failures is at best a limited success.

At the 2000 CCAMLR meeting, krill quotas have been increased despite the lack of data on how krill fishing affects localised predator species. CCAMLR does not expect to have a krill fishery management plan in place for another 5-10 years.[428] A TAC of four million tonnes for Area 48 has been recommended by the Scientific Committee. Environmentalists at the meeting were concerned about this increase and argued for smaller management units, and for more scientific information on predator affects.[429] While the krill fishery in the late 1990s has a wider range around the Southern Ocean, the bulk of the krill harvest is still taken in the areas of great historical activity. So far the actual catch is not increasing rapidly, but the possible catch has increased by several factors. If actually harvested it would be form a significant proportion of the global fishery, and possibly be the largest crustacean fishery in the world. ASOC and Greenpeace fear that concentrated krill harvesting will have a severe local impact on dependent species and that the time lag between detection of a problem and reaction to it will allow vested commercial interests to exploit it.[430]

A question that may be answered in the near future is how amenable krill is to IUU fishing; is it the 'pink gold' of the Southern Ocean, like the 'white gold' of toothfish has been? Modern processing techniques make human consumption of krill more possible, giving krill harvests a higher value than the 1970s-80s, and it can still be a low value animal meal product. Pink dye may be able to be extracted from the shells of the krill, which may be of high value in the Salmon farming industry.[431] At the moment it seems clear that if there is money to be made, with a low risk of being caught, then there will be IUU fishing, and

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[427] D. R. Rothwell, *The Polar Regions and the Development of International Law*, Cambridge University Press: Cambridge, 1996.p.133.
[428] "Business as Usual for CCAMLR as Antarctica's Fish and Wildlife Hang in the Balance", Hobart, 3 November 2000, http://www.asoc.org/finalpress.htm (site visited 27 March 2001).
[429] "Krill – the Harvest Floodgates are Opening", *ECO*, 3, 26 October, CCAMLR-XIX, Hobart, Tasmania, http://www.asoc.org/ECO2.htm (site visited 3 November 2000).
[430] Alan Hemmings Interview, 22 November, 2000.
[431] ibid.

CCAMLR will be slow to react. For krill the continued resistance of the fishing nations to the installation of VMS on krill vessels is an ominous sign.

What more might CCAMLR do?

Joyner in 1998 suggested that management policies are required for CCAMLR that:

> (1) restore and maintain the ecological balance between target, dependent, and related species; (2) foster rapid recovery of depleted whale and fish populations; (3) prevent wasteful use and depletion of dependent and associated populations, as well as target species; and (4) protect breeding areas and other habitats of biological importance to target, dependent, and related populations.[432]

Restoring and maintaining the ecological balance is going to be difficult while fishing continues with high incidental mortality, and while adequate models have not been developed. Recovery of depleted stocks requires a continued prohibition on their harvesting, and leaving a surplus in the ecosystem by not harvesting all of the krill 'surplus'. The concept of a MPA is one which could help protect breeding areas and other important habitats. Increasing the effectiveness of existing CCAMLR conservation measures will require action in several different areas: increased cooperation with other IGOs; support for developing international environmental law associated with the new global fisheries regimes; enforcing regulations on nationals regardless of the flag they hide behind; and cooperation with third-party states. Many of these areas overlap and interact with each other. For example, it may be difficult to secure the cooperation of third-party states without being seen as enforcing regulations on member nationals; yet enforcing these regulations may also require the cooperation of the third-party states.

Some progress of VMS and CDS has been made; but more is required for full effectiveness of these conservation measures. As in the past, progress in the future will depend on the timely provision of the best scientific advice. "Management and conservation of living resources in the Antarctic commons can only work as well as the weakest data assumptions that support such policies ... [the] Scientific Committee must be capable of predicting accurately the effects of harvest levels and strategies on target, dependent, and associated

[432] Christopher C. Joyner, op. cit., p.145.

species."[433] SCOI lacks the secretarial support available to the Chair of the Scientific Committee and may need to be reorganised to increase its effectiveness.[434]

Conclusions: CCAMLR at the limits of rational use?

This IUU issue is important because the ATS is founded on a spirit of cooperation, as well as a sense of pragmatic self-interest. If this reciprocity is not respected the consequences for the ATS could be dire. The external credibility of the ATS is threatened if its own members do not follow the rules. Why should third-party states comply with regulations, or even consider joining the ATS? Compared to early meetings of CCAMLR a huge number of conservation measures are being passed, which makes the regime appear to have resolved its internal problems. The actual effectiveness of the measures being passed is debatable. As far as the IUU fishing issue is concerned CCAMLR is still a reactive regime, due to the lack of information assembled before fishing began, and not the precautionary regime that was hoped for when it was negotiated. The commitment to conservation from many of the CCAMLR members is lacking. With the gradual global momentum towards high seas regulation CCAMLR risks being bypassed as the source of authority and innovation in the Southern Ocean. "CCAMLR talks about conservation but it is, in fact, a regime for exploitation. The exploitation is, of course, to be done 'rationally' – but it is still exploitation."[435]

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[433] ibid.
[434] *Commission for the Convention for the Conservation of Antarctic Marine Living Resources, CCAMLR XVII: Hobart, 26 October – 6 November 1998, Report of the New Zealand Delegation*, Antarctic Policy Unit: Wellington, November 1998, p.14.
[435] Keith Suter, *Antarctica: Private Property or Public Heritage?,* Pluto Press Australia: Leichhardt, 1991, p.40.

Chapter 6

Analysis: Regime Theory and CCAMLR

This analysis will be built on the theories outlined in chapter 2 as they can be applied to the context of the case study outlined in chapters 3-5. The aim here is consolidate and refine regime theory concerning the effectiveness of regimes, and to focus on theoretical issues relating to epistemic communities, and regime change. In the first section a natural experiment will be pursued through analysing the conservation measures adopted by the CCAMLR Commission and their evolution over time. The impact that these measures have had on the problem of IUU fishing and by-catch to date will be examined. In the second section counterfactual arguments will be explored in four areas: the idea of a world without the CCAMLR regime; the different possibilities of initial regime construction; different responses to the IUU problem; and what CCAMLR might have been like without IUU fishing. In the third section the determinants of effectiveness are used to analyse the effectiveness of the CCAMLR regime. In the fourth section the concept of the epistemic community will be investigated. Finally in the fifth section the different models of regime change will be applied to the case study.

Natural Experiments: Conservation Measures

The approach taken here is first to analyse the significant thematic areas of conservation measures developed by the Commission.[1] The themes to be analysed include: VMS, CDS, flag state measures, cooperation with third-party states, cooperation between contracting parties, and incidental mortality. This will illustrate the impact on the problem of IUU fishing by the CCAMLR regime, and how the conservation measures have changed the behaviour of the CCAMLR members, or associated companies, NGOs, and individuals.[2] Then a collective analysis of the effectiveness of the conservation measures as a whole can be attempted.

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[1] See Chapter 2, pp.44, for the methodology of natural experiments.

[2] "An institution is effective to the extent that its operation impels actors to behave differently than they would if the institution did not exist or if some other institutional arrangement were put in its place." Oran R. Young, 'The Effectiveness of International Institutions: Hard Cases and Critical Variables' in James N.

Vessel monitoring system

The monitoring of international fisheries is problematic due to the fragmented nature of the industry and because most actual harvesting occurs out of sight.[3] If the monitoring of fisheries can be improved then the actors involved may be more willing to engage in mutual self-restraint, as it will be easier to put pressure on those who violate the rules. The new technology for monitoring uses the detection capabilities of satellites to make the activities conducted by fishing vessels equipped with VMS more transparent to a monitoring agency. CCAMLR has been taking steps to implement a VMS in the Southern Ocean, first with Resolution 12/XVI in 1997, and then followed by Conservation Measure 148/XVII in 1998. However, a VMS was not required to be operational until 31 December 2000, so it is difficult at this stage to fully assess the effectiveness of the VMS for CCAMLR. As more states implement the system it should become more effective. This implementation appears slow considering that proposals were first made in CCAMLR to investigate VMS in 1993 and that by 1996 individual members had started implementing VMS on a national level.[4] The operation of VMS is feasible, and the cost is not too prohibitive.[5]

The compulsory use of VMS is not a replacement for the inspection system, but it complements and reinforces existing conservation measures. VMS is useful for conservation measures relating to the management of fishing effort and closed areas of fishing where discrete geographical boundaries can be drawn. It would also help identify IUU fishing vessels, as any vessel encountered by patrols not fitted with VMS can be presumed to be engaged in IUU fishing.[6] A centralised system coordinated through the CCAMLR secretariat would be best, otherwise there is a need to ensure that there are obligations for information sharing between the members.[7]

Rosenau & Ernst-Otto Czempiel, *Governance Without Government: Order and Change in World Politics*, Cambridge University Press: Cambridge, 1992, p.161.

[3] Marc A. Levy, Oran R. Young, and Michael Zürn, op. cit.

[4] In 1997 Australia, Chile, New Zealand, and South Africa reported to SCOI on their efforts using VMS to monitor their vessels in the Convention Area. CCAMLR-XVI, Annex 5 Report of the Standing Committee on Observation and Inspection, 1.63, p.133. In 1995 it had been estimated that CCAMLR could implement a fully operation VMS in one and a half to two years. CCAMLR-XIV, 2.36, p.133.

[5] The VMS issue is also examined at Chapter 5, pp.205-207, and Chapter 6, pp.282-285.

[6] Victoria Hallum, op. cit., pp.38-40. See also the discussion on p.242 below in relation to Conservation Measure 118/XVI.

[7] Conservation Measure 148/XVII is currently based on flag state monitoring of VMS on flagged vessels, with the CCAMLR secretariat being informed before the annual meeting of any flag vessels entering the CCAMLR area improperly.

The most important limitation on the effectiveness of the current VMS conservation measure is that it does not apply to the krill fishery. Considering the potential for the krill fishery to expand quickly between seasons, this is a significant defect in the potential effectiveness of the VMS scheme. It also provides a potential loophole for trawl fishing of finfish species, although the development of other conservation measures may restrict this defect. Most of the impact of VMS will be on the legitimate fishing operators, who will have to install and maintain the VMS on their vessels. Overcoming resistance from the fishing states to the inclusion of VMS in the krill fishery appears difficult. Their unwillingness to change their behaviour may indicate a desire to avoid any restrictions on fishing. The current approach from the conservationist states appears to be to embed the VMS scheme further into other measures developed by CCAMLR, expanding its use and acceptability. While VMS has evolved over time into a more effective measure it has gaps and is incomplete.

Trade related measures

It has been difficult to implement trade related measures under the CCAMLR regime because of resistance from some CCAMLR members. This is unfortunate as trade related measures offer some of the best opportunities for undermining the economic incentives that have encouraged the development and persistence of IUU fishing in the Southern Ocean. The trade measure being developed by CCAMLR is that of the CDS which was implemented in May 2000.[8] The ATCM intervention in 1999 that assisted the adoption of the CDS conservation measure was a significant event, in that it demonstrates that the ATCPs are willing to prompt action from CCAMLR if it is not developing effective conservation measures in a timely fashion, an important example of linkage between parts of the ATS regime. The scheme was further developed the following year with three resolutions on the use of the scheme by third parties, VMS application to CDS, and port avoidance. This is an unusually large number of resolutions to be adopted on a similar conservation measure area at a single meeting of the Commission. This may indicate that the urgency of the situation is forcing some concessions from the fishing states to the conservationist states, but not to the extent that binding measures are agreed too.

[8] The CDS measures are discussed at Chapter 5, pp.187-188 and 197-201, and Chapter 6 pp.285-286.

One reason for the slow development has been fears of inconsistency with the WTO. This is because market control measures are subject to review by a WTO dispute settlement process as market restrictions may conflict with WTO obligations to treat like products in the same way, regardless of their origin. There is some acceptance of the necessity for trade restrictions for environmental agreements. Restrictions would also have to be placed on CCAMLR member nationals if they are to be applied to third party states. One method of implementation could be to adapt the ICCAT system, a staged process that takes several years before sanctions can take full effect.[9] CCAMLR could also consider the use of a regional register and blacklisting of violators, as has been used by the FFA, and individual members could exclude violators from their EEZs or vessel registries.[10]

Market end controls involve the closing of markets to fish that has not been caught in accordance with the CCAMLR conservation measures. One failing of the CDS is that it does not really use market controls, a result of it being watered down in negotiations from a certification scheme into a documentation scheme. Another weakness is that Patagonian toothfish are a straddling stock, unlike Antarctic toothfish which are found only within the Convention Area, and this means IUU fishers can attempt to declare Patagonian toothfish as having been caught in the high seas.[11] At the moment CDS effectiveness has been affected by the transhipping of toothfish through China into Japan,[12] and through Canada into the United States.[13] Even if those loopholes are tightened the effectiveness of the scheme is tied to the retention of the major toothfish markets within CCAMLR members.

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[9] In 1999 ICCAT recommended that its contracting parties prohibit the import of Atlantic swordfish from Belize or Honduras, following a 1998 decision identifying Belize and Honduras as fishing in a manner that undermined ICCAT conservation measures, and after efforts to communicate with Belize and Honduras had proven unfruitful. See ICCAT Recommendation 99-8 'Recommendation by ICCAT Regarding Belize and Honduras Pursuant to the 1995 Swordfish Action Plan Resolution', http://www.iccat.es/ (site visited January 28, 2002).

[10] Victoria Hallum, op. cit., pp.51-52. The adoption in 2000 of Resolution 13/XIX 'Flagging and Licensing of Non-Contracting Party Vessels' is a step in this direction.

[11] See Chapter 5, note 62, p.171 for an example of past doubts about catch declarations.

[12] "China has emerged as a significant supplier of Patagonian Toothfish products to the Japanese and US markets. These two markets imported over 3600 t of Patagonian Tooth-fish from China in 2000, predominantly in the form of fillets (Table 6). Japan imported two-thirds of the fillets, reflecting the presence of a number of Japanese-owned processing plants in China. Since China is not a known catching country, it is believed that its involvement is by way of importing, processing and re-exporting Patagonian Toothfish.", M. Lack and G. Sant, *Patagonian Toothfish, Are Conservation And Trade Measures Working?*, TRAFFIC, 2001, http://www.traffic.org/toothfish/toothfish.pdf, (site visited January 28, 2002), pp.11-13.

[13] ibid., p.12, "Canada, an Acceding State to CCAMLR, and an increasingly significant importer of Patagonian Toothfish, has yet to demonstrate any commitment to implementing the CDS. The EC's tardiness in implementing the Scheme and Canada's reluctance to do so indicate a lack of commitment to the elimination of IUU fishing for Patagonian Toothfish. By contrast, a positive development has been the recent confirmation that China is actively participating in the Scheme."

A lot of the political attention of CCAMLR was invested in the CDS and for the moment it is not clear if that investment will pay off and increase the effectiveness of the regime. If the CDS had not been adopted in 1999 the credibility of the ATS would have been undermined even further than it already has been by the IUU problem.

Flag state enforcement measures

A variety of measures are possible under the heading of flag state enforcement, including vessel licensing and marking requirements.[14] In 1997 CCAMLR adopted Conservation Measure 119/XVI requiring contracting parties to licence their flag vessels. In 1998 it was amended and adopted as Conservation Measure 119/XVII on licensing and inspection obligations for flag vessels. To this was added Conservation Measure 146/XVII on the marking of fishing vessels and gear. These do potentially increase the effectiveness of CCAMLR, but these requirements have been widely flouted. Vessels engaged in IUU fishing frequently conceal or alter their vessel markings.[15] Licensing restrictions and sanctions have been evaded through reflagging a vessel to a third-party state that is not bound by the conservation measures of CCAMLR. This reflagging has been one of the most serious non-compliance problem as IUU fishing has expanded as it increases the difficulty of identifying who is responsible for IUU fishing.[16]

Current international environmental law does not lend itself to an easy resolution of this issue. UNCLOS Article 91 on the Nationality of Ships has vaguely expressed rules that are difficult to test or enforce. The UNIA does provide a precedent for shared enforcement mechanisms.[17] The FAO Compliance agreement helped inspire CCAMLR Resolution 13/XIX 'Flagging and Licensing of Non-Contracting Party Vessels', but at the time of writing the FAO agreement is yet to enter into force itself. The reflagging problem is one that occurs in other settings, so opportunities should exist for CCAMLR to learn from the experience of other fishery management regimes.

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[14] See Chapter 5, pp.194-197.
[15] See Chapter 5, p.189.
[16] Victoria Hallum, op. cit., p.42. "Although reflagged, the vessels still maintain significant links to their previous country of registration, most significantly the return of profits."
[17] UNIA, Articles 20-21.

The reliance on flag state measures and the traditional reluctance of flag states to cede authority over vessels to international organisations has retarded the adoption of collective enforcement methods and the development of new flag state measures. Collective enforcement faces the difficulty of the differing positions held by the CCAMLR members regarding territorial sovereignty in Antarctica and the Falkland/Malvinas Islands. On the whole the amount of time wasted on the preservation of existing positions in these sterile rituals is frustrating in its affect on negotiations for conservation measures. This problem requires improved relations between Argentina and the UK, but neither state appears likely to change its basic positions on the dispute at this time.[18]

The problems with collective enforcement do not mean that other innovations could not be made for flag state measures. The measures adopted and implemented by Norway appear to have been effective in reducing the involvement of Norwegian nationals and companies in IUU fishing.[19] However, Norway's attempt to make a positive contribution to the adoptions of similar flag state measures in CCAMLR has been blocked by the EC and other members.[20] If similar measures were applied by other problem states, such as Spain, they might be very effective. At the moment they are only likely to be implemented on a voluntary basis, which will lead to partial coverage. CCAMLR has been designed to leave the responsibility of enforcement largely to the flag states, so in order for it to be more effective in the future it will have to devise new methods for flag state enforcement that apply jurisdiction to nationals and companies that evade licensing and marking requirements through reflagging. Resolution 13/XIX may be a first step in that direction.

Cooperation with third-party states

CCAMLR does not appear to meet all of the criteria of an objective regime that would create rights and obligations for third party states.[21] In an ideal world states with vessels that become involved in harvesting activities in the Southern Ocean would be expected to accede to the Convention and to eventually become members of the Commission. In

[18] See Chapter 5, pp.220-222, and Chapter 6, p.244-245.
[19] See Chapter 5, p.196.
[20] See Chapter 5, p.218.
[21] See discussion by Arthur Watts, op. cit., pp.160-163 and pp.295-298., Emilio J. Sahurie, op. cit., pp.130-134, Bruno Simma, "The Antarctic Treaty as a Treaty Providing for an Objective Regime", *Cornell International Law Journal*, 19 (2), 1986, pp.189-209, and Jonathon I. Charney, "The Antarctic System and

practice there is a gap between the ideal and reality, and many states have lacked either the capacity or the foresight to join CCAMLR.[22] Developments in international environmental law have increased the obligations of states. UNCLOS Articles 117 to 120 impose obligations to cooperate with respect to the conservation of living marine resources and Article 300 is a good faith clause. These principles have been expanded through UNIA. In theory the options that should be exercised by a third-party state are either to prohibit their flagged vessels from such activities or join CCAMLR, but in practice it is possible a state may choose to ignore these requirements or lack the capacity to react to events. However, these obligations of international law put CCAMLR members in a good position to put pressure on non-parties through political and diplomatic means.[23]

The Commission has frequently contacted third-parties about the activities of their flagged vessels and nationals in the Convention Area. During the early period of CCAMLR this was not a significant problem, but with the reflagging of vessels that occurred during the expansion of IUU fishing in the early to mid-1990s it became a serious problem for CCAMLR that undermined the effectiveness of its conservation measures and the enforcement efforts of its members. In 1997 the Commission adopted Conservation Measure 118/XVI, in which there is a presumption that third-party flagged vessels in the Convention Area were undermining the conservation efforts of CCAMLR. In that year the Commission also adopted a communication policy to follow up on this conservation measure. One part of this policy was to inform states of the problem of IUU fishing and to ask them to consider acceding to the Convention. The second part was to ask states to consider sending observers to the Convention. In 1998 Conservation Measure 118/XVII was amended and updated to include a reference to VMS.

The success of the communications policy has been mixed. The response from some of the states involved in reflagging, such as Belize, Portugal, and Panama, has been minimal. The policy appears to have been most effective with Namibia and Vanuatu, and to a lesser extent with Mauritius. Namibia and Mauritius and have attended the Commission meetings from 1998 to 2000. This has been followed by Namibia acceding to the Convention in 2000, and Vanuatu acceding in 2001. Despite attending the CCAMLR meetings, Mauritius

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Customary International Law", in Francesco Francioni, and Tullio Scovazzi (Eds), *International Law for Antarctica*, Kluwer Law International: The Hague, 1996, pp.51-101.

[22] See also Chapter 4, pp.120-121, and Chapter 5, pp.192-194.

[23] Victoria Hallum, op. cit., pp.45-51.

has remained a centre of IUU operations in the Indian Ocean, and has only recently appeared to be taking greater steps to deal with the landing and transhipping of toothfish caught in IUU operations through its ports. This may have been in response to pressure from the UK, France and the environmental groups.

Another area of difficulty in third-party cooperation has been with the implementation of the CDS. China, an ATCP, and Canada, an acceding state to CCAMLR, have both presented problems to the implementation of CDS and have diminished its initial and potential effectiveness as a measure against trade in *Dissostichus* spp. This resulted in the adoption of Resolution 14/XIX 'Catch Documentation Scheme: Implementation by Acceding States and Non-Contracting Parties'. It is too early to tell what the effectiveness of this resolution will be, but without cooperation from third-party states the CDS can be evaded through landing and shipping toothfish through third-party states into markets which may be in CCAMLR member states.

The fact that measures against reflagging were considered necessary does indicate that the earlier efforts to enforce conservation measures on the vessels of CCAMLR members had some effect, even if that effect was not to increase compliance. Earlier detection of the flags of convenience problem may have been retarded by the slow development of a system of inspection and observation. Current detection would be assisted by implementation of VMS. The issue of cooperation with third-party states will be an on-going one. One difficulty here is that dealing with 'cooperating' third-party states may potentially undermine the incentives that a state might have to actually become an acceding or contracting party to the Convention by blurring the boundary between compliant member state and a non-compliant third-party state.[24]

Cooperation between contracting parties

Cooperation between the CCAMLR members is essential for success as cooperation with third party states is, because unilateral action will not be effective on the high seas where multilateral actions are required.[25] CCAMLR has taken some steps towards strengthening the enforcement obligations, but has encountered difficulty in developing an approach

[24] See Chapter 5, pp.218-219 for one example of this kind of friction involving Portugal and the EC.
[25] See Chapter 5, pp.201-205 for some examples of CCAMLR interactions with other organisations.

common to all CCAMLR members, that also has flexibility for domestic implementation. Developments in international environmental law have assisted this. UNIA contains clear and specific implementation and enforcement obligations in Part V: Duties of Flag States, Article 18, and Part VI: Compliance and Enforcement, Article 19. Such 'soft law' hortative developments may be ameliorating opposition from fishing states as conservation measures from more fishing management regimes are interlaced together.

In response to IUU fishing the main cooperative development has been Conservation Measure 147/XVII, later amended and adopted as 147/XVIII and then as 147/XIX. This port state measure helps the Commission track the trade movements in *Dissostichus* spp. through inspections of the catch being landed or transhipped through a member's port. This builds on the precedent for port state measures in UNIA Article 23 and is most effective where the choice of ports is restricted by geography.[26] Vessels often need to use port facilities going to and from the Convention Area and if the IUU vessels can be displaced further away from the fishing grounds their operating costs will increase, reducing profits and the incentive to poach. For example, the closest ports to the Ross Sea region are in New Zealand and Australia, both CCAMLR members. The significant change in 147/XIX is that the Secretariat is to be informed of any ship denied port access or permission to land or tranship *Dissostichus* spp. Improved future effectiveness may require more coordination through the Secretariat, rather than a reliance on the traditional bilateral arrangements that predominated in the early period of CCAMLR.

The harmonisation of conservation methods used by the Convention and by those members exercising coastal state sovereignty in the Southern Ocean could make conservation measures more effective. In recent years there has been a decline in reservations made by South Africa, Australia, and France about the application of CCAMLR measures within the jurisdiction of their sub-Antarctic islands. However, the relationship between Argentina and the UK, and to a lesser extent between the UK and Chile is a difficult one due to the overlapping territorial sovereignty claims in Antarctica and the Falklands/Malvinas Islands dispute. Attempts at harmonisation have often resulted in long disputes in the Commission meeting as the claimants hedge their bets on their claims.[27] Unilateral implementation of port state and inspection measures by the claimants can also be divisive in the

[26] Victoria Hallum, op. cit., pp.52-53.
[27] See Chapter 5, pp.220-222.

Commission. This does not contribute towards the effectiveness of CCAMLR due to the time wasted. It is also a problem in that the area in dispute, including Subareas 48.3, 48.2, and 48.4, is one of the main fishing grounds in the Convention Area.

Incidental mortality

CCAMLR has been successful in some areas of incidental mortality but not in others.[28] The impact of fishing on the seabed has not been perceived as a significant problem so far. The entanglement of marine mammals in marine debris or fishing nets was a more serious issue. Resolution 7/X on driftnet fishing, in combination with efforts at the UN and elsewhere, has meant that driftnet fishing is not currently a problem for CCAMLR and is unlikely to be so in the future. Efforts to develop fishing techniques that minimise marine mammal entanglement are ongoing. Marine debris does remain a problem, despite Conservation Measure 63/XV which addresses this issue. This is because compliance with the conservation measures from the IUU operators is minimal.

Incidental mortality among seabirds has been the greatest by-catch problem for CCAMLR, drawing attention from the late 1980s onwards. Conservation Measure 30/X banning net monitor cables has been very effective in reducing incidental mortality in trawl fisheries.[29] There has been a good level of compliance, and trawlers do not appear to be involved with IUU fishing to the same extent as longline vessels. In recent years the problem has been more with the longline fisheries, especially the IUU fisheries which do not comply with the efforts to reduce by-catch required by Conservation Measure 29/X. These measures have been effective only in the legitimate industry, and even then there have been many small problems with compliance.[30] This is an area where CCAMLR can be very effective, but first it has to gain control of the IUU fishing. One reason for this potential effectiveness is that technical solutions to the problem in longline fishing are possible, and the economic incentives favour the adoption of methods that minimise incidental mortality. Seabirds that can get at hooks and remove bait are reducing the chances of catching fish. Not catching seabirds is also good for marketing the fish to consumers. For the time being with the large numbers of seabirds killed and threatened species, CCAMLR is not effective in this area.

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[28] See Chapter 5, pp.208-216.
[29] CCAMLR-XVIII, 6.10, p.23.
[30] CCAMLR-XVI, 6.42, p.18, CCAMLR-XVIII, 8.5, p.30. In the 1999/2000 split year compliance was good in some fishing areas, and poor in others. CCAMLR-XIX, 6.12, p.30.

Collective analysis of conservation measures

The term conservation measure may at times be a misnomer, as many of the conservation measures adopted by CCAMLR have been those relating to the increase in legitimate fishing in the Southern Ocean. The number of conservation measures being adopted each year is higher than during the early period of CCAMLR, but the number of measures that relate to directly increasing the conservation of living resources remains small.[31] The bulk of the conservation measures relate to the regulations for fishing. Since 1991 and Conservation Measure 31/X a conservation measure has been required for notification of a new fishery. Since 1993 and Conservation Measure 65/XII a conservation measure has been required for exploratory fisheries.[32] Other conservation measures are used to specify the TAC for a species in a particular fishing season.[33]

Table 3
Conservation Measures and Resolutions adopted
by the CCAMLR Commission, 1982 - 2000[34]

Year	Conservation Measures Adopted	Resolutions Adopted
2000	36	4
1999	26	0
1998	28	0
1997	31	1
1996	21	0
1995	14	0
1994	13	1
1993	16	2
1992	20	1
1991	15	0
1990	11	1
1989	5	2
1988	2	0
1987	3	0
1986	4	1
1985	1	3
1984	2	0
1983	0	0
1982	0	0

[31] See Chapter 4, pp.143-147 for more detail on the development of CCAMLR conservation measures.
[32] See Chapter 4, pp.149-150 for more detail on the development of new and exploratory fisheries.
[33] See Chapter 4, pp.147-149 for more detail on the development of the quota system.
[34] Table formulated based on information in various CCAMLR reports.

The figures in Table 3 are distorted by the fact that some measures remain in force indefinitely, while others must be renewed from year to year to remain in force. There is also the fact that many key conservation measures have been amended over the years and adopted again by the Commission. There does appear to be a trend of rising interest in new fisheries during the period from 1995 to 1999, which have now been developed into exploratory fisheries, although not all new fisheries are developed.

Table 4
CCAMLR New and Exploratory Fisheries, 1991-2000

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000
New	0	0	0	2	6	7	3	1	0
Exp.*	1	1	1	1	1	5	5	9	12

* Includes 1 measure for crabs in each year

There is no 'magic bullet' to solve the problems of enforcement and compliance in the Southern Ocean. Individual conservation measures complement and reinforce previous efforts. The basic structure of the Convention was realised with the establishment of SCOI in 1988. If the new additions to the framework of conservation measures, such as VMS and CDS, prove ineffective then either further measures will be needed, or a crisis may require a rethink about the basic norms and principles of the regime. Of these norms and principles, that of rational use is more easily reinterpreted than those related to territorial sovereignty. The principle of ATCP dominance of Antarctic conservation has been undermined by the necessity of cooperation with states that are not part of the ATS regime. So far the assessment that can be made of the effectiveness of CCAMLR in attaining the objectives of the Convention is mixed. Despite a difficult start and some progress CCAMLR still has many problems to overcome before it can be considered fully effective.

The impact of CCAMLR on the problem of IUU fishing in the Southern Ocean has been limited, and this has limited the impact that CCAMLR can make on incidental mortality. The VMS measures are limited by the lack of application to the krill fishery. The CDS is limited in its lack of ambition and potential to be undermined by a lack of cooperation. Flag state measures are promising, but appear to have been blocked by fishing interests. Cooperation with third party states is essential, but difficult to achieve in practice with states that lack the resources to fulfil their international obligations. Cooperation with

member states is also essential, but in practice has been difficult to achieve at times because of the sovereignty issue. The objectives of CCAMLR are still sound ones, but significant parts of the scientific basis for rational use and sustainable management of resources remain to be completed. In the meantime CCAMLR is progressing ahead with developing fisheries and expanding the potential krill catch when a more precautionary approach might be justified.

Fishing states have accepted some limitations on their freedom to fish on the high seas, but progress has been slow and only partially effective. New legal rules can always be responded to with evasive behaviour. Given the examples of evasive non-compliance by CCAMLR members new rules need to target the right 'bad' actors involved in the problem. Something CCAMLR needs to discuss is whether it would be more effective to target individuals, companies, or the member states with new rules designed to target their market incentives in order to improve compliance. Compliance from nationals and companies from Norway has improved, while that of Spain remains poor. Cooperation with Namibia is now cemented with the accession of Namibia to the Convention, and cooperation with the Mauritius and Vanuatu may be improving.

Economic factors over which the CCAMLR members can only exert influence with great difficulty are significant in determining whether fishing will occur. The low harvesting of krill in recent years has been due largely to its low value, which could change in the future.[35] If the value of toothfish changes due to market forces the scale of IUU fishing may change accordingly, with higher prices leading to more fishing, and vice versa. Another possibility is that the toothfish market may split into a high value legal market, and a lower value illegal market.[36] Other trends in global fisheries, such as changes in global fishing catch capacity, developments in other fisheries regimes and new international agreements, will also affect the degree of compliance with CCAMLR conservation measures.

Traditional methods of enforcement that rely on sea patrols, airborne surveillance, and inspection and observation schemes, are unlikely to be completely effective in the Southern Ocean due to the size of the waters in the Convention Area and the jurisdictional

[35] See Chapter 5, pp.231-234.
[36] See Chapter 5, p.230.

problems in the high seas. Even if more resources are allocated to enforcement by the CCAMLR member states the sheer size of the Southern Ocean will reduce the effectiveness of these methods. Some at sea vessel inspections are not made because of environmental conditions.[37] CCAMLR needs to be innovative and develop new techniques that will be more effective at dealing with the problems of the Southern Ocean without requiring a large increase in resources. Improvements to the observation and inspection system can be made in two areas. First, if the members can allocate resources to allow more frequent inspections then that will have a greater deterrent effect. Second, the members could overcome the reluctance to have a more centralised inspection system.[38]

Counterfactual Arguments

Some of the critical junctures in the ATS regime involved the negotiation of the Antarctic Treaty in 1959 and the subsequent negotiation of further conventions within the framework of the ATS.[39] Without the Antarctic Treaty the ATS regime would not exist in its current shape and the Antarctic region might not have been established as a place of peace and science. The other main critical juncture of the ATS regime was the negotiation of the CRAMRA treaty, followed by the decision to defect by France and Australia from ratification, and the subsequent negotiations that lead to the establishment of the Madrid Protocol. The focus of counterfactual arguments in this thesis will be on the critical junctures for the CCAMLR regime. These arguments may shed some light on the effectiveness of CCAMLR when compared with reasonable 'what if' situations that might otherwise have occurred.

A world without CCAMLR: open slather or world park?

CCAMLR was negotiated by the ATCPs in anticipation of significant interest in krill harvesting in the Southern Ocean.[40] It was a logical extension of the Agreed Measures and CCAS, and a step towards the subsequent CRAMRA negotiations and the possibility of

[37] See Chapter 5 pp.182-183 for examples of the difficulties in patrolling the Southern Ocean.
[38] Victoria Hallum, op. cit., pp.37-38.
[39] See Chapter 3, pp.64-68 for background on the Antarctic Treaty, and pp.68-82 for the development of the ATS.

resource exploitation on the continent of Antarctica. If the ATCPs had ignored this interest in krill, say for example because of the value placed on the freedom of the high seas in the Antarctic Treaty and the desire to maintain the sovereignty compromise that allowed the continent to be reserved for peace and science, then the Southern Ocean would have been left with CCAS and the Agreed Measures to provide the bulk of the ATS protection for the environment, while the IWC would have covered whales. In this situation the fact that krill did not prove to be a high value fishery, and that the ability of the Soviet Union to subsidise operations in the Southern Ocean ended after the end of the Cold War, would have limited the impact on krill.[41] If the value of the fishery had been higher then there probably would have been more extensive harvesting of the krill, with effects that probably would have been similar to the overharvesting of the finfish species that occurred before CCAMLR historically entered into force. If this had occurred then attention probably would have been given to developing a management regime, but the regime would have been a reactive attempt after damage had been done to the krill stocks and the dependent species. Attempting to negotiate a regime under significant commercial pressure could have possibly altered the regime more towards harvesting than conservation goals.

If CCAMLR had not been negotiated in the early 1980s then the shape of environmental protection for the Southern Ocean might have been developed outside of the ATS. It is possible that the FAO may have become more extensively involved in the Southern Ocean and attempts to manage the fisheries there.[42] With the exploitation that has occurred in the Southern Ocean in the 1990s, and the changes in global fisheries, some kind of management regime for Southern Ocean fisheries might have been negotiated and implemented sooner or later under the auspices of the FAO. The potential involvement of states outside the ATS would have significantly altered the governance of the Southern Ocean and Antarctica, and might have undermined the compromise on territorial sovereignty in the Antarctic Treaty. It is also possible that more of the territorial claimants may have considered the option of establishing EEZ, or the potential for an EEZ, off their claim in a manner similar to that of the Australians. This might have resulted in more unilateral enforcement attempts and less collective work towards multilateral solutions to problems.

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[40] See Chapter 3, pp.72-77, and Chapter 4, pp.102-103, and pp.113-118 for more detail on the CCAMLR negotiations.
[41] See Chapter 3, pp.99-101, and Chapter 4, pp.109-112 for more detail on krill harvesting.
[42] See Chapter 4, pp.113-115.

If a management regime to cover the Southern Ocean had been negotiated in the absence of CCAMLR and at a later date – such as the early 1990s – its characteristics would probably have differed greatly, reflecting the trends in the development of international environmental law. A regime negotiated in the post-UNCED environment would have been more likely to have included NGO observers from the outset. The strength of the conservation objective of the regime might have been stronger if more conservationist states from outside the ATS community were involved in the negotiations. Such a regime may have had a good framework for conservation adapted from other management regimes, but it would have lacked the database of information that CCAMLR had accumulated, and the models developed after years of collective work. The early effectiveness of any conservation measures would have been limited unless a rigid precautionary approach was adopted from the outset, where large scale fishing was prohibited until proven sustainable.

Another area to consider is the idea that the success of CCAMLR was a contributing factor to the negotiations for CRAMRA. It has also been argued by ASOC that if CCAMLR had not existed, then when the CRAMRA negotiations collapsed and CRAMRA was replaced by the Madrid Protocol, it would have included within its boundary and scope the responsibilities that currently lie with CCAMLR.[43] Were the CRAMRA negotiations possible without the success of CCAMLR? If CRAMRA was not actually negotiated then the political impasse that led to the Madrid Protocol may not have occurred. Problems with pollution at scientific bases and the growth of tourism on the continent all could have been handled within the existing ATS framework. For example, Tourism can be handled through regulations based on nationality of the tourists or the tourist operators, or regulations concerned with the ports and airfields necessary for tourist operations in Antarctica and the Southern Ocean. However, actual exploitation of mineral resources would have been a point of friction that the ATS probably could not cope with in its existing structure because of the direct implications to territorial sovereignty. This would have made negotiations for CRAMRA likely even if the CCAMLR negotiations had been drawn out over a longer period of time, or if they had been unsuccessful. So the ASOC argument is not completely improbable.

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[43] "The Madrid Protocol", *ECO*, Volume CXXXVIII, No.1, 26 October, 1998, Hobart, Australia. See also ASOC, *Report of the Antarctic and Southern Ocean Coalition (ASOC)*, XXII ATCM/IP84, 1998, p.5.

CCAMLR has also been held up as an early example of the application of the ecosystem principle and the precautionary approach in conservation regimes. If CCAMLR had not been negotiated it would not have been able to serve as such an example, and this may have hindered the adoption of the ecosystem principle and the precautionary approach in the broader global setting. Because the ATCPs would have been unlikely to have implemented a moratorium on fishing a reactive fishing management system would probably have followed after abuse of the living marine resources of the Southern Ocean. On the whole it seems reasonable to conclude that if CCAMLR had not been negotiated then the environmental protection of the Southern Ocean would have been weaker than it is today. This is because conservation measures would have been developed later, on the basis of less data and scientific analysis, with a greater degree of friction over the sovereignty issues.

A different CCAMLR?

Another critical juncture to consider is whether or not the CCAMLR regime could have been a more effective one than was actually negotiated. In this respect it is best to focus on the options that were considered during the negotiations, but were considered historically possible by some of the states involved, and that were either not adopted, or were left to be adopted or worked out after the Convention entered into force. Some of the areas that can be considered here are the decision-making rules of the Commission and the Scientific Committee, the system of observation and inspection, conservation measures, and the role of scientific advice.

A majority or qualified majority-based decision-making system was an option considered in the CCAMLR negotiations.[44] If it had been adopted then the early dispute over decision-making in the Scientific Committee, a dispute that prevented significant work at the first CCAMLR meeting, would not have been a problem.[45] However the presence of a majority system would have acted as a disincentive for fishing states to join the Convention if there was a majority of conservationist states in the Commission, which would have reduced the goal effectiveness of the regime, even if the process-effectiveness was higher. In the 1990s

[44] James N. Barnes, op. cit., p.251 and p.254, David M. Edwards and John A. Heap, op. cit., p.357, and Ronald F. Frank, op. cit., pp.309-310.
[45] See Chapter 4, pp.128-130.

under a majority system some of the resolutions adopted by the Commission could have been adopted as conservation measures, and this may have made the Convention more effective in dealing with the IUU problem. VMS and CDS measures might have been in place a year earlier than was the case.[46]

A system of observation and inspection was clearly seen as necessary to the effective implementation of the Convention, but the best that could be achieved in the negotiations was were Articles IX (1) (g) and XXIV, that required such a system to be implemented.[47] In the interim period bilateral arrangements were made between Members.[48] This was not as effective due to the lack of centralised coordination or common standards. A more rapid implementation of the system could have lead to more effective inspections that may have detected the scale of the rise of IUU fishing a year or so before it became undeniable. An earlier implementation of observers would have improved the data collection of CCAMLR, and given much stronger evidence for the scale of incidental mortality in the fisheries of the Southern Ocean. As by-catch from longlines in the regulated industry was amenable to technical solutions it seems reasonable to assume that a measure similar to Conservation Measure 29/X could have been adopted a year or so earlier than it was.

Another area where the design of the CCAMLR regime could have been improved was in the way that scientific advice was to be used in making management decisions. It required a significant assertion of its prerogatives on the part of the Scientific Committee to get the Commission to rely on the advice of the Scientific Committee, rather than that of the fishing states, when making management decisions in the Commission.[49] If this had been clearer in the Convention, or resolved sooner, then the development of the CCAMLR approach to management under conditions of uncertainty may have occurred in less time.[50] This may have reduced disputes over TAC allocation or strengthened the adoption of the precautionary approach in conditions of uncertainty.

While the early shape and implementation of the CCAMLR regime could have been more effective it seems unlikely that it would have developed a framework of conservation

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[46] See Chapter 5, p.230.
[47] See Chapter 4, pp.152-156 for more detail on the development of the system of observation and inspection.
[48] Appendix II, Article XXIV (3).
[49] See discussion in Chapter 4, pp.127-137.

measures that would have anticipated the rise of IUU fishing in the 1990s and effectively dealt with the problem. This is because IUU fishing was not considered a major potential problem during the CCAMLR negotiations. It would be very difficult from the viewpoint of 1980 to imagine that in 2000 CCAMLR member nationals and companies would be going to elaborate lengths to evade compliance with CCAMLR regulations, establishing complex smuggling networks to ship the illicitly harvested fish to markets around the world.

CCAMLR was the result of a compromise between those states interested in fishing and those interested in conservation. Negotiations conducted in the real world, with resource constraints, and deadlines, are often imperfect in their results. The ambiguity inherent in CCAMLR means that the extent of its application is a contestable concept that can be redefined over time. A more rigid, authoritative convention might not have lasted, or have gained the agreement of states involved in fishing activities. A majority based decision making may have made the process of CCAMLR more effective, leading to synergies throughout the regime that would have made it more comprehensively effective over a shorter time period – but this system was likely to have proved unacceptable to the fishing states. Without the data provided by the fishing states CCAMLR would not have been in a position to pass effective conservation measures, or to develop its scientific models.

Different responses to IUU fishing by CCAMLR?

For CCAMLR to have responded differently to IUU fishing the time when IUU was either detected, accepted as a problem, or reacted to effectively would have to change. This means exploring when attention was given to the problem, what was proposed and not adopted, or not adopted quickly enough, and to consider what else could have been adopted. Most conservation measures were adopted quickly enough after discussion at one CCAMLR meeting. Measures relating to VMS, CDS and flag state enforcement have not been so easily accepted. Would it have been reasonable for the CCAMLR members to have put aside their established political and economic interests in favour of the environment? However, it would almost be contrary to the norm of compromise in the ATS regime for the members to be so altruistic.

[50] See Chapter 4, pp.137-141 for more detail on the development of the CCAMLR approach to ecosystem management.

Recognition of the IUU problem could have occurred in 1995 but at that point it appears that Chile and Argentina were acting defensively in the Commission about IUU fishing operations based in their states and this may have delayed early conservation measures.[51] A VMS conservation measure could probably have been adopted in 1997 and a CDS conservation measure in 1998, if the political will to support them had existed.[52] The coverage of the measures could also have been expanded so that there were fewer loopholes that could be exploited. The failure to extend VMS to vessels fishing for krill is difficult to understand in terms of conservation and except in terms of fishing operators seeking to avoid regulations of almost any kind on their commercial activities. For the CDS had been more stringent in its requirements, then it could have had a greater impact on the Japanese and United States markets.[53] The lack of flag state measures is disappointing given the success enjoyed by Norway in its unilateral actions against its own nationals and companies.[54]

It appears unlikely that the moratorium option could have been implemented by CCAMLR before the 2000/2001 season, or even seriously considered unless the regime was in a state of crisis that had forced a revaluation of its basic principles and norms.[55] While that might occur if krill was over-exploited the commercial extinction of one finfish species and the associated incidental mortality among several hundred thousand seabirds has not been sufficient to generate that kind of pressure. Sea birds are not viewed as an economic resource, except perhaps indirectly for tourism, so arguments in favour of their conservation must rely more on the value ascribed to preserving the ecosystem than what might be contained in the principle of rational use. So far one of CCAMLR's main responses has been to continue expanding the fisheries rather than contracting them. In 2000 New Zealand appeared to be the only member willing to conditionally support the moratorium policy.[56] It will be interesting to see at future CCAMLR meetings if pressure from environmental NGOs affects the position taken by other conservationist CCAMLR members.

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[51] See Chapter 5, pp.172-173.
[52] See Chapter 5, pp.197-200 for detail on CDS negotiations, and pp.205-207 for VMS negotiations.
[53] See Chapter 5, pp.200-201 for an assessment by ASOC of weaknesses in the CDS.
[54] See Chapter 5, p.196.
[55] See Chapter 5, pp.224-228 for detail about the moratorium issue.
[56] See Chapter 5, pp.226-227.

The weight attached to the rational use objective can outweigh the weight attached to the conservation objective, the ecosystem principle, and the precautionary approach. The underlying assumption that fishing is permitted until proven harmful does not make acceptance of a moratorium an easy task. If the assumption underlying CCAMLR was that fishing is prohibited until proven sustainable, then a moratorium would be easy to implement as a response to IUU fishing. Conservation Measures 31/X and 65/XII which require Commission approval before the initiation of new and exploratory fisheries are a step in this direction. However, it is in the setting of TAC for harvested species that the Commission can exert the greatest influence. CCAMLR is still allocating access to new and exploratory fisheries and setting TAC through political bargaining rather than on the basis of the best scientific advice provided by the Scientific Committee. When the scientific models are improved, possibly sometime in the next five to ten years,[57] then the conservation measures may become more precautionary.

It was not impossible for CCAMLR to have responded on a faster time scale to the IUU problem than has occurred, but it was unlikely. Given the presence of the fishing states in CCAMLR, it was unlikely that the political will to overcome obstructions and objections to more effective conservation measures could have been generated more quickly than it did. Unlike with the CRAMRA negotiations, the ability of the environmental NGOs to mobilise public support is low because the toothfish and sea bird species lack some of the public appeal found in other environmental issues.

CCAMLR without IUU fishing?

It is interesting to consider the judgements that might have been made about the effectiveness of the CCAMLR regime if IUU fishing for toothfish had not occurred in the 1990s. Without the unregulated fishing the incidental mortality figures would have been significantly reduced, as the amount of longlining would have been reduced, and longliners have been a major source of incidental mortality.[58] Krill fishing was yet to increase

[57] See Chapter 5, note 428, p.233. The problems and current state of the art in the CCAMLR models are discussed in Constable, A. J., W.K. de la Mare, D.J. Agnew, I. Everson and D. Miller, "Managing Fisheries to Conserve the Antarctic Marine Ecosystem: Practical Implementation of the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR)", Paper presented to ICES/SCOR Symposium on 'Ecosystem Effects of Fishing', 15-19 March, 1999, Montpellier, France, SC-CAMLR-XVIII/BG/26, 23 October 1999.

[58] See Chapter 5, pp.210-216.

significantly on levels in the early 1990s and the crab and squid fisheries had not proved a great problem as their commercial viability in Antarctic waters is yet to be proven. Scientific models for dealing with uncertainty are being developed and have achieved some progress towards their goals.[59] Some of the finfish stocks that were over-exploited prior to the Convention entering into force have seen some limited recovery, and renewed exploitation was not considered likely. For example, interest in *E. carlsbergi* has been limited in recent seasons.[60] These factors would have suggested that CCAMLR was capably managing the Southern Ocean and confidence would have been high that an increase in krill fishing would have been coped with by CCAMLR. This in turn would have reinforced the credibility of the ATS regime.

However, in the absence of the stimulus provided by shock of IUU fishing it is difficult to imagine that many of the conservation measures put in place to deal with the IUU problem would have occurred independently. VMS had been considered a good idea for some time, but the fishing interests would have continued to oppose its implementation as an unnecessary burden, and the high level of political will required for the adoption of the CDS would not have happened. Cooperation efforts with third-party states would have been unlikely if they were not involved in fishing in the Southern Ocean. In this respect CCAMLR may have actually ended up in a worse position than it currently occupies to deal with a sudden rise in the harvesting of krill, especially if this involved IUU fishing.

CCAMLR may have adopted some measures in response to learning from other IGOs and from national VMS schemes. CCAMLR has adopted some initiatives that were first used elsewhere in dealing with incidental mortality, but without IUU fishing the urgency would not have been in place for swift adoption. Support would also not have existed for the adoption of conservation measures that further expanded the basic framework of CCAMLR, away from simple limitations on catch and effort.

Without the IUU fishing problems the environmental NGOs would remain concerned about incidental mortality and the general slow progress of CCAMLR in actualising the precautionary approach and developing its ecosystem models. However, there would have

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[59] See Chapter 6, note 57, p.256. More background on CCAMLR scientific models can also be found in: Karl-Hermann Kock (ed), *Understanding CCAMLR's Approach to Management*, May 2000, http://www.ccamlr.org/English/e_pubs/e_app_to_manag/TEXT_final_.pdf, (site visited March 19, 2001).
[60] Chapter 5, pp.223-224.

been little that could have been used as the basis for generating public interest in the problems of the Southern Ocean, and political pressure to solve those problems effectively. A moratorium would not have been a serious consideration for policy by any of the conservation minded states. Domestic pressure for any new and exploratory fisheries to be opened up for exploitation by the regulated fishing industry would have continued.

The proposal that IUU fishing might not have occurred is based on assumptions made about changes in the global context of fisheries. For IUU fishing not to have occurred in the 1990s then, *inter alia*, the capacity of the global fishing fleet would need to have been lower, meaning that there was less capacity to be displaced to the southern ocean. Less exploitation of stocks elsewhere in the 1980s would have reduced incentives to expand fishing into the Southern Ocean, as in part the value of toothfish would have been lower if the traditional stocks, such as North Atlantic Cod, had remained plentiful. On the whole this seems to have been an unlikely possibility. Efforts are now being made to tackle capacity, by-catch, and IUU problems at the global level.[61] This may mean that the chances of new IUU fishing problems in the Southern Ocean is reduced.

Summary

The development of IUU fishing, although a shock to CCAMLR, was the probable outcome in light of global developments in fishing. All it took to trigger IUU fishing was the spread of knowledge about the existence of a previously largely unexploited species of fish. If CCAMLR had not existed, then effective response to the problem would likely be minimal outside of the coastal state jurisdiction around the sub-Antarctic islands and the slowly emerging global cooperation on fisheries issues. CCAMLR could have been designed to be more effective, but that was an unlikely outcome from the consensus bargaining that took place in the CCAMLR negotiations. The development of CCAMLR conservation measures could have been more effective. The response to IUU fishing could have been more effective. Of course this judgement of effectiveness is one that favours the primary conservation objective of the Convention over the exploitation objective. For a state interested in fishing in the Southern Ocean the burdens imposed by CCAMLR have been introduced at a slow pace while access to the new fisheries has not been greatly impeded. From this perspective CCAMLR is a mixed success.

The Determinants of Effectiveness

Using the determinants of effectiveness from chapter 2, the CCAMLR regime will be critically assessed to find the extent to which the issue of IUU fishing has increased, or reduced, the effectiveness of the CCAMLR regime. This is done by conceptualising the issue as a shock that has required the attention of CCAMLR in order for it not to be undermined and rendered ineffective by the shock.[62] The way in which CCAMLR responds to the issue can be used in an attempt to reconfirm the importance of these determinants of effectiveness and to reveal points that were not well known before.

Transparency as a determinant of effectiveness

In the area of effectiveness-oriented transparency CCAMLR has made it clear that it has been struggling to achieve its conservation goals in the face of IUU fishing.[63] Apart from the Commission meeting in 1995 there has been little subsequent argument over whether or not the issue is a serious one for the regime.[64] The knowledge of the extent of the damage to *Dissostichus* spp. stocks and sea bird species is inaccurate because of the nature of the issue area rather than any deliberate obscuration on the part of CCAMLR. It is limited in the area of compliance-oriented transparency in that at ATS meetings the identity of the member states involved in IUU fishing remains hidden. This is probably done in order to facilitate cooperation and bargaining within the regime and any reputational opprobrium has been indirect.[65]

The environmental NGOs through the public media have been responsible for publicly identifying the CCAMLR members and third-party states who are involved in IUU fishing. There does not seem to be much pressure to develop greater compliance-oriented transparency within the Commission. The exception here was New Zealand, which has made it clear that it will identify any state involved in IUU fishing in the Ross Sea, but these efforts were made in relation to defending New Zealand interests in the Ross

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[61] See Chapter 3, pp.92-95.
[62] This is based on Oran Young's 'hard case' concept, see Chapter 2, pp.41-42.
[63] See Chapter 2, pp.45-46 for theory about transparency and effectiveness.
[64] See Chapter 5, pp.172-173.
[65] See Chapter 5, pp.190-192, for how NGO actions have gone some way towards identifying those responsible.

Dependency.[66] The publication ECO, a version of which is produced by environmentalists at CCAMLR meetings and ATCMs, is a source of information about some of the negotiations that occur. However, there is a limit to what the NGOs can do without risking their access, as the leak in 1998 demonstrated.[67]

The supply of information has been affected by the IUU shock in several respects. The systems of observation and inspection have been amended in several ways, such as collecting information from observers about vessel sightings,[68] although the number of inspections carried out remains low. The CDS has the potential to increase the information available to the Commission about the trade in toothfish, where it is transhipped and what markets it ends up in. Through communicating directly with third-party states that have flag vessels in the Convention Area, information is being distributed about the problems of the Southern Ocean that was unlikely to happen before. The VMS also has the potential to increase the capacity for the regime to collect more information from legitimate fishing activities. These are all developments that would have been unlikely in the absence of the IUU shock, or that would have been implemented more slowly without it. Much of the information is still provided by self-reporting and there is a range in the amount of detail in the information provided in the reports to the Commission about members activities in the Convention Area. Other reporting has become more common with the presence of IUU vessels and their encounters with enforcement patrols, as the flag state is often unaware of the activities of their flagged vessels.

A frustrating paradox for CCAMLR is that as greater efforts are exerted through enforcement to gain compliance, the information that it has on the IUU problem has become less accurate than it was when the problem first became salient in 1995.[69] In this respect the CCAMLR regime is not producing accurate information about the problem. Another area where effectiveness can be improved is in sourcing and coordinating information. CCAMLR has been insistent on a high degree of accuracy of information in the past, up to an evidential standard. When dealing with a problem that involves nationals who are deliberately attempting to evade detection a lesser standard of evidence may be more useful for triggering intervention and action. CCAMLR may also have to become

[66] See Chapter 5, p.183 and 195.
[67] See Chapter 5, pp.181-182.
[68] See Chapter 4, p.155.
[69] See Chapter 5, p.184.

less reliant solely on the member states for provision of information, and centralised coordination of information through the CCAMLR Secretariat would improve the response to IUU fishing. Although the fishing states will be uncomfortable at the thought of relying more extensively on information sourced from NGOs this does seem a promising area to gain more information. ASOC has now been admitted to SCOI and the members could make better use of the ASOC observer and their information.

Table 5
Number of Inspections Made in the Convention Area, 1989-1999[70]

Year	Inspections
1998/1999	3
1997/1998	3
1996/1997	4
1995/1996	5
1994/1995	1
1993/1994	3
1992/1993	1
1991/1992	2
1990/1991	0
1989/1990	1

The IUU fishing shock does not appear to have made CCAMLR significantly more transparent that it was before the shock. There is more regime-relevant information available, but this has happened in large part due to the efforts of environmental NGOs, or through steps that the Commission would have taken regardless of the IUU shock.[71] The unreliability of statistics corrupted by IUU fishing also undermines the confidence in which CCAMLR TAC setting can be held. The regime and its decision-making procedures are more open to observers now that ASOC has access to SCOI, but some of the bargaining processes that occur within CCAMLR continue to be obscured in the margins of the meeting. An improvement in compliance-oriented transparency may increase the political pressure for flag state measures that could improve the effectiveness of CCAMLR. CCAMLR is still struggling to acquire enough information to coordinate its response to IUU fishing, and still lacks the level of information that would be required to initiate a sanctioning process.

[70] Table formulated based on information in the various SCOI reports. See also Chapter 4, pp.153-154.
[71] The establishment of a CCAMLR web page has increased the ease with which some information can be gained about the CCAMLR regime, notably conservation measures and the reports of the Commission and

Robustness as a determinant of effectiveness

One dimension of effectiveness is that of robustness and fragility in terms of the regime issue area as it is affected by the IUU fishing problem.[72] Here the question is whether the CCAMLR regime is stable and if the shock has made it more or less robust. The second dimension is that of robustness and brittleness in terms of adjustment to broader social changes without radical transformation. Here the question is how resilient the regime has proven in the face of the external challenges. Two areas that highlight both of these dimensions are membership and decision-making procedures.

The changing membership over the years as the number of CCAMLR members has increased to twenty-four, along with seven acceding states, has not noticeably affected the stability of the CCAMLR regime.[73] If the decision-making mechanism was a majority system, then it would have been crucial how many states joined and whether their interests were weighted towards conservation or exploitation of the resources in the Southern Ocean, such as has happened with the IWC. With a consensus system each interest group can generally form a blocking coalition to prevent unpalatable measures from being adopted in the Commission. A majority system might allow too rapid a change for the comfort of states with preferences that are being outvoted. CCAMLR has usually been of more interest to states with fishing interests, as until the IUU problem there was little state or public pressure for immediate and effective action for conservation. This can be contrasted with the case of the IWC where considerable public pressure exists against a resumption in commercial whaling.[74]

The IUU issue has caused some membership problems. One difficulty with membership is the potential friction caused by EU members who are not members of the Commission. This caused problems when Portugal became interested in Southern Ocean fishing without first joining CCAMLR.[75] Dealing with third-party state problems has seen an attempt to expand involvement with CCAMLR by previously uninterested states. There has not been a flood of new membership of CCAMLR and although Namibia, Mauritius, and Vanuatu

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Scientific Committee, but the bulk of the working papers are not transcribed for electronic publication. Some sections of the web page remain restricted to members only.

[72] See Chapter 2, p.47.

[73] See Chapter 3, note 131, pp.76 for a list of the CCAMLR member states and acceding states.

[74] See Chapter 3, pp.97-98.

have become involved with CCAMLR, other states remain uninvolved. No CCAMLR members have been so unsatisfied with the outcomes of CCAMLR to the point where they have considered resigning their membership, or exercising a formal objection to a conservation measure. Another aspect of the membership issue has been the participation of environmental NGOs in CCAMLR, an example of broad social change since the founding of the CCAMLR regime.

Although the decision-making procedures of CCAMLR have attracted criticism in the past,[76] the CCAMLR members are not advocating for change and the existing procedure is accepted and worked within. It is a system that can promulgate conservation measures, although this was difficult during the 1980s.[77] The consensus system has not been changed, although it has expanded into the Scientific Committee and into the Working Groups at the insistence of the fishing states. A significant expansion in the conservation framework has come in response to the IUU fishing problem, but the extent of the change has limits, with most members being unwilling to accept a moratorium and a number of members continue to oppose the introduction of VMS.[78] The interpretation of the principle of rational use that favours resource exploitation continues to dominate decision-making, so that fisheries expand when a precautionary approach might be more useful for the conservation objective of the Convention. At this stage changing the consensus based social-choice mechanism seems unlikely as it would be too radical for the fishing states and the territorial claimants whose interests are protected and embedded within the current Convention.

CCAMLR does not appear to be fragile or brittle at this stage, in that it has not been swept away by its problems, and has adapted in a limited way to deal with those problems. The IUU issue has not made the Commission less stable, nor has it caused all new conservation measures to be halted or old beliefs to be immediately discarded. Membership has expanded slightly in response to the issue. This gives CCAMLR the potential to be more effective in the future if it is able to evolve and increase its capacity to deal with the problems that it is facing. If CCAMLR fails to deal adequately with the IUU fishing problem, then its decision-making procedures may come under pressure to be changed, but this would occur too late to be of any use to the exploited species. In this instance criticism

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[75] See Chapter 5, pp.218-219.
[76] See Chapter 4, p.106 and pp.158-160.
[77] See Chapter 4, pp.143-145 and pp.150-151.
[78] See Chapter 5, pp.226-227 and p.207 respectively.

of proposals to expand the krill industry in light of what has occurred with finfish exploitation in the 1990s is ominous. A robust regime is not necessarily one that produces rapid results.

Transformation rules as a determinant of effectiveness

CCAMLR has no specific review mechanism, although that function might be filled by the ATCPs at an ATCM, or by the members of the Commission.[79] For the most part CCAMLR has been left to evolve independently through its own decision-making procedures and awareness that it was a component of the ATS regime. These transformation rules were fairly clear-cut and stringent, once the decision-making in the Scientific Committee was clarified in the first few meetings.[80] CCAMLR appears to be an evolutionary regime with the capacity for change rather than a static organisation with a tendency to stagnate, although for a period in the 1980s it was very difficult for change to occur in CCAMLR.[81] However, the stringency of the consensus requirement does impede the efforts of those advocating alterations to the framework of conservation measures. This is important because many of the existing rules have been violated with ease by the IUU fishing operators, and the difficulty in introducing new rules delays an effective response to the IUU fishing problem.

The shock posed by IUU fishing has not generated any pressure for change of the transformation rules. The closest the environmental NGOs have come is to offer the possibility that CCAMLR could import Madrid Protocol environmental protection initiatives,[82] but this is still advocating for change within the system rather than change of the system. The possibility of a dramatic break from CCAMLR to a new regime at the moment appears low. One reason why the Madrid Protocol could displace the CRAMRA regime was that no one was actually mining in Antarctica. CCAMLR would be harder to displace as exploitation of marine resources has already happened and harvesting activities are ongoing. If CCAMLR fails to gain control of IUU fishing and its decision-making procedures become paralysed, then there might be initiatives for substantial change in the

[79] See Chapter 2, pp.47-48 for more detail on transformation rules.
[80] See Chapter 4, pp.127-130.
[81] See Chapter 4, pp.133-135 for detail on the difficulty in getting members of the Commission to accept advice from the Scientific Committee.

transformation rules. If the krill resource is grossly mismanaged then external interest and pressure on CCAMLR might also lead to change. At this point expanding the coverage of the Madrid Protocol to the CCAMLR Area might be an easier solution than negotiating a new convention, but it is hardly one that will appeal to states whose primary interest is in harvesting operations. The Madrid Protocol would not act as panacea for the problems in the Southern Ocean, as it has had its own share of problems in implementation. So far however, the IUU issue is yet to substantially affect the transformation rules of CCAMLR and the ATS.

Capacity of governments as a determinant of effectiveness

The effectiveness of CCAMLR depends on the ability of its members to implement regime requirements, and this in turn depends on the capacity of individual member states to make and enforce rules.[83] The members of CCAMLR have a broad range of individual capacity, from the super power United States to developing states. Capacity is not limited to power resources, it also affected by the attention that a government gives an issue, the alignment of domestic political interests,[84] and its knowledge base. Lack of capacity means a state is less able to exercise leadership, one example of this within CCAMLR is Russia, which formerly as the USSR was a superpower that dominated Antarctic politics in conjunction with the United States, but now lacks the resources to play its old role. Some members contribute little towards CCAMLR's efforts at problem-solving despite possessing the capacity to do so. One example of this is India, which tends to be silent in the Commission on the IUU fishing issue.

The military power resources allocated by CCAMLR members with sub-Antarctic EEZ to enforcement directed against illegal fishing have increased in recent years. This kind of enforcement is expensive and imperfect, limited by the environmental conditions and geographical distances involved. New conservation methods that do not require great expense to gain compliance are preferable to expensive enforcement efforts. One reason for the delay in VMS implementation has been the cost of implementing the system, even

[82] ASOC, *Report of the Antarctic and Southern Ocean Coalition (ASOC)*, XXII ATCM/IP84, 1998, p.5. See also p.250 above.
[83] See Chapter 2, pp.49-50 for more detail on government capacity, and Chapter 4 pp.113-122.

though a large part of this cost could be passed on to the fishing operators. CCAMLR would do well to implement measures that affect the financial outcomes of IUU fishing, such as market end measures, rather than relying legal sanctions that require enforcement action in the Southern Ocean.

One cause of delay in implementing CCAMLR conservation measures is a lack of capacity to effectively implement new measures in a domestic framework, such as the time taken to implement legislation, increase budgets, train customs officials, and inform domestic actors. Having large numbers of low capacity states join CCAMLR, such as Namibia and Mauritius, may not necessarily lead to an improvement in the effectiveness of CCAMLR. CCAMLR is not a regime that is likely to engage in capacity building side-payments. The budget does not exist for such innovative measures, and any increase in the budget in terms of real growth will be resisted by some of the existing members, such as Germany.[85] However, some degree of capacity building will occur as regime-relevant information is more freely shared among CCAMLR members. The cost of joining CCAMLR as a member depends on whether the state is engaged in harvesting and the general level of harvesting activities. If no harvesting was occurring in the Convention Area the cost of membership to support the current budget would be approximately $A74,000.[86] Contributions from new members have in the past been used by the Commission to fund one-off projects, but in general there is little reserve financial capacity for innovation by the CCAMLR Secretariat. Early indications are that the CDS will require significant resources for successful implementation, and so far the political will exists among the CCAMLR members to meet this cost. In these respects the IUU shock has increased the effectiveness of CCAMLR.

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[84] This can depend on factors relating to the states proximity to the Southern Ocean, the extent of its involvement in fishing activities, and the varying level of environmental awareness in the state's domestic arena.

[85] German policy is to aim for zero real growth in budgets because Germany has to fund a high proportion of the EU budget. See Chapter 4, note 84, p.117.

[86] Calculated by dividing the 1999 CCAMLR budget figure of $A2,000,200 by 23 – the number of members at that time.

Distribution of power as a determinant of effectiveness

Where capacity is the ability to implement a desired action, power is often the ability to determine which course of action will be implemented in an issue area.[87] The distribution of power within CCAMLR is quite varied. The United States is the obvious superpower, but the EU is also powerful, and some members and acceding states are now drawn from developing states such as Uruguay, Namibia and Peru. One area in which power is important is in the resources that can be devoted to the production of scientific research in the ATS. A state that can back up its views with research is in a better position to influence a meetings outcomes, and may generate new ideas that lead to new conservation measures.

The United States played a significant role in the development of the CDS. The draft conservation measures were developed and promoted by the United States, with Tucker Scully heading several late night sessions.[88] Despite this role, the United States has not imposed its preferred solution to the problems on the other CCAMLR members. The United States is powerful, but unlike the EU it has not had a strong stake in the fishing operations in the Southern Ocean, apart from a limited role in the exploratory crab fishery.[89] If this changes then in the future the United States may play less of a role in introducing conservation measures in CCAMLR as its domestic interests shift from being mainly conservation to more of a balance between conservation and commercial exploitation. The United States has announced its interest in participating in the krill fishery in the future.[90]

The main application of material power in the Southern Ocean has been by SORS using enforcement methods in the areas of their jurisdiction. This application of power does influence the decision-making in CCAMLR, in part because of the care that went into designing CCAMLR so that it was compartmentalised separately from those sub-Antarctic Island areas where coastal state jurisdiction is undisputed. The application of conservation measures in these areas is not automatic.[91] Material power is also possessed by states that

[87] See Chapter 2, pp.50-51.
[88] Scully was thanked by CCAMLR on at least two occasions. See CCAMLR-XVIII, 5.17, p.14, and CCAMLR-XVII, 18.1, p.91.
[89] See Chapter 5, pp.164-165.
[90] The United States participated in the 2000 Krill Synoptic Survey, and according to CCAMLR-XIX, 4.6, p.13,"The USA reported it will have one or two vessels ... fishing for krill."
[91] See Chapter 3, p.73.

dominate the markets where toothfish are sold or traded through, such as China and Canada. Intermediary port states where transhipping occurs are also in a position to use material power as are the 'gateway' states with ports used to access the Southern Ocean. The effectiveness of enforcement and conservation measure actions will depend in part on how this material power is used, and awareness of this may influence decision-making.

The IUU shock has not really affected the distribution of material power in the CCAMLR regime, but it has made that distribution more salient. Despite the effects of the consensus system the regime is not a symmetrical one, but it is not so asymmetrical that one or a few members dominate the regime. The situation is also not one where the old original members of the ATS club continue to dominate over the newer members, because some of the newer members have joined CCAMLR due to their interest in fishing, such as Spain, Poland, and Korea. This gives the new members substantial leverage within the CCAMLR regime as they are in a position to control the activities of their nationals who are engaged in fishing activities, something that other states are unable to do to foreign flagged vessels on the high seas. Conditions at the moment do allow for leadership to be exercised in support of the conservation objective, but there is no guarantee that this will continue indefinitely.

Interdependence as a determinant of effectiveness

The ATS regime is founded in interdependence because the ATCPs were only able to achieve their goals through collective cooperation that minimised the negative externalities that unilateral actions in Antarctica could have.[92] The impact of IUU fishing in this area is that it has made it clear that the activities of nationals of one CCAMLR member in the Convention Area can be prejudicial to the interests of other CCAMLR members. Reciprocity can be expressed in the CCAMLR system through the decision-making procedures with the threat or use of withholding consensus over an issue, or by expressing a reservation or objection to a conservation measure. The complicated process whereby TAC are set and permits allocated to different members for fisheries contains a lot of potential for bargaining.

[92] See Chapter 2, pp.51-52.

There appears to be a balance of interests between conservationist and fishing states, conservation states can not demand too much change, and fishing states must usually concede a few points. There are limits to what can be attempted here as any actual use of a 'veto' is inherently destabilising for the regime. Use of the objection procedure would also be destabilising if a delegation was pressured into making concessions that are not acceptable to their government. ATS regime reciprocity is centred around the 'spirit of cooperation', which is a regime norm that supports compromise between the members. Where compromise does not occur over intractable issues, such as the sovereignty dispute, then there is the risk of a breakdown in the system. The IUU shock may make CCAMLR less effective if it leads to a paralysis in the decision-making process between the conservationist and fishing interests. So far the Commission has avoided deadlock, and where meetings have ended without a particular measure being adopted there has usually been some kind of intersessional program of work on the measure.[93]

The trend towards interdependence is growing slowly in the ATS regime as new economic activities have developed in Antarctica and the Southern Ocean. In the past the ATS regime has coped reasonably well with issues arising from sovereignty disputes, sealing, mining. However, tourism and illegal fishing pose management challenges to the ATS regime. Some linkages can be developed between these new issues, because if incidental mortality does make threatened species of sea birds extinct, then this may reduce the value of tourism in the Southern Ocean and Antarctica. The regulation of tourism requires careful attention to port state, vessel flag state, and tourist nationality, and this may lead to some linkages being made on similar CCAMLR regulations. CCAMLR members have made linkages with other issue areas in order to improve compliance with conservation measures by third-party states. For example, the UK has threatened to close its markets to Mauritius, while France offered to resolve sovereignty over a disputed island with Mauritius, in an attempt to get Mauritius to crack down on the presence of IUU fishing operators in its ports.[94] Increased interdependence may make CCAMLR more effective, but this will not be automatic.

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[93] See Chapter 5, p.196, pp.198-199, and p.203, for information about intersessional discussions on CCAMLR vessel register, the CDS, and an action plan, respectively.

[94] Personal Notes, Alistair Graham Lecture, 22 June, 2000. See also Chapter 5, note 171, p.187.

Nature of the issue area as a determinant of effectiveness

The origins of the ATS regime are quite important in determining its effectiveness.[95] The IGY and the Antarctic Treaty were regarded as signal achievements in their day, and the record of cooperation between ATS members has continued to the present day. This 'spirit of cooperation' is a factor for effectiveness in the ATS and CCAMLR. The nature of the Antarctic Treaty and its ambiguous compromise on sovereignty also affects the entire ATS regime. Treaty ambiguity is an important source of non-compliance, although ambiguity can allow greater flexibility in finding solutions to problems. The bi-focalism of CCAMLR is not completely effective in resolving the sovereignty problem, as can be seen by the continued disputes between Argentina and the UK within the Commission.[96]

The Southern Ocean is part of the problem, and its distance from the traditional fishing grounds is no longer sufficient protection. The sheer size of the waters in the Convention Area and the jurisdictional maze that overlies them impedes effective enforcement. Environmental factors can prevent inspections and impede surveillance. These are not factors that are likely to change in the future. An increased fishing effort in the Southern Ocean increases the chances of accidents occurring to fishing vessels in a region where liability issues are difficult to resolve. The basic legal structure and values of the ATS and CCAMLR regimes remain largely the same as they were when IUU fishing started to be a problem.

The lack of ambiguity as to the seriousness of the issue has helped focus political attention on solving the problem of IUU fishing. It is now an established part of the Commission's agenda and gets the attention it requires. There was some debate in 1995 as to the seriousness of the IUU fishing issue but from 1996 onwards it has continued to be viewed as a threat to the credibility of the CCAMLR regime.[97] The language used in statements made by members in the Commission made it clear that they saw the issue as undermining the effectiveness of CCAMLR conservation measures, and as having the potential to undermine the ATS – a point underlined by the ATCM resolution in 1999 on the issue. The inevitable time-lag in response makes early detection of a problem crucial to its effective

[95] See Chapter 2, p.52.
[96] See Chapter 5, pp.220-222.
[97] See the various statements made by CCAMLR members in the Commission in Chapter 5, pp.176-180.

resolution. In this respect CCAMLR may have been more effective in detecting the problem if the systems of observation and inspection had been implemented at an earlier date. CCAMLR can only speculate as to the extent of IUU fishing in the 1980s and the early 1990s.

Summary

Oran Young has suggested that the ATS regime can be considered effective, but that most fisheries regimes are ineffective.[98] However, the ATS regime includes a fisheries management regime, and some of the reasons that have made the ATS regime effective are not necessarily going to make the CCAMLR regime effective. While the consensus decision-making procedures have created a fisheries regime that is stable and robust enough to cope with changes in membership and the increased role played by environmental NGOs, the regime is more brittle and may lack the resilience required to deal effectively with new problems. It is especially concerning that the economic incentives are sufficient to encourage fishing operators to violate the CCAMLR rules with relative impunity. This is also highlighted by the lack of a review mechanic if the decision-making procedures of CCAMLR ever does have a crisis that paralyses its response to a problem. This may act as an incentive for compromise, as members may wish to avoid the uncertainty that would result. Interdependence is an essential part of the norms supporting the role of compromise in the 'spirit of cooperation', and new linkage areas are possible, such as in the expanding Antarctic tourist industry.

CCAMLR has some areas where it could increase its effectiveness, especially in the area of compliance-oriented transparency, where innovative use could be made of NGO information sources. This is important in keeping political attention focused on a distant area where material power is insufficient by itself to solve the problem of IUU fishing. CCAMLR needs more information about the state of the marine resources and the extent of the IUU fishing operations in order to increase its problem-solving effectiveness. CCAMLR effectiveness may be increased as its membership expands, although most of the new members possess little capacity for implementing CCAMLR requirements. While the SORS are influential in CCAMLR, it is the United States, Spain, Japan and the EU

[98] Oran Young, "The Effectiveness of International Environmental regimes: A Mid-Term Report", *International Environmental Affairs*, 1998, p.272.

which have the ability to make the greatest positive or negative contribution to CCAMLR effectiveness in the due to their influence over fishing effort and markets.

The shock of IUU fishing had a mixed impact on the effectiveness of the CCAMLR regime. CCAMLR has had to adopt and implement new conservation measures that may reduce the impact of IUU fishing in the future. The shock has caused an improvement to the effectiveness of CCAMLR that has probably happened at a more rapid pace than would have otherwise occurred. However, this increase in effectiveness has not been sufficient to date to bring the problem of IUU fishing under control. It is interesting that much of this framework might have been put in place before IUU fishing occurred, if CCAMLR had been able to learn from the experience of other fisheries management regimes. However, the interests of fishing states blocked this learning until the scale of the IUU fishing problem made it impossible for the necessity of change to no longer be ignored. The initial response from CCAMLR from 1995 to 1998 was inadequate to deal with the IUU fishing problem. This has contributed to an undermining of the regime's authority in the Southern Ocean, and perhaps a loss of goodwill and trust in the ability of CCAMLR to deal with this and future problems. This may affect the strength of the ATS regime in the future if the ATCPs continue to value stability over resilience.

Because the decision-making in CCAMLR is supposed to be made on the basis of the best scientific advice provided by the Scientific Committee, a member that is capable of contributing new information and ideas to CCAMLR can be influential through the possession and use of 'epistemic power'.

Epistemic Communities and CCAMLR

In the past attention has focused on the role that epistemic communities have played in regime formation, and their ongoing role in the maintenance of a regime has attracted less attention. This thesis is interested in finding if an epistemic community has contributed to the effectiveness of CCAMLR in dealing with the IUU fishing problem, and whether or not any linkages can be drawn with the determinants of effectiveness. The following

sections overlap, in that it is difficult to demonstrate influence without tracing activities, and difficult to identify beliefs without identifying a group.[99]

Identifying the epistemic community

Identifying an epistemic community and its membership within CCAMLR is a difficult task. It has been suggested that a proliferation of epistemic communities claiming to provide advice is likely.[100] According to Adler and Haas epistemic communities tend to be small groups,[101] and this group may only be a subset of the people present at a meeting or otherwise involved in the issue area. Epistemic communities can also be very transient and short lived. This suggests that an epistemic community is subject to constant incremental change, so that the membership boundary of any epistemic community, will be fuzzy and indeterminate. This makes operationalisation at the micro-level extremely difficult.[102]

This research started by assuming that the Scientific Committee would form an identifiable epistemic community within the CCAMLR regime. It is a group of professionals with recognised expertise and competence in the domain of Southern Ocean science, and with an authoritative claim to policy-relevant knowledge in that area. This followed the line taken by Elliott, who tried to apply the epistemic community framework to the ATS scientific community,[103] and Parera, who viewed the role of SCAR in the early decades of ATS policy process as an epistemic community.[104] Study of the Scientific Committee reveals a more complicated picture which invalidated this initial assumption. Elliott found that the scientific committees have not acted as an epistemic community in the past. While they provided advice and recommendations, there was no conscious and active policy advocacy.[105] This meant that the 'epistemic power' in the ATS regime was able to be captured by other actors.

In a formal sense the policy advocacy of the Scientific Committee is limited to providing the Commission with the best possible scientific advice and recommendations. The advice

[99] See Chapter 2, pp.32-37 for an summary of epistemic community theory and pp.53-54 for the methodology used here. The concept of intellectual order is discussed in Chapter 2, pp.52-53.
[100] Andreas Hasenclever, Peter Mayer, and Volker Rittberger, op. cit., p.216.
[101] Emanuel Adler and Peter M. Haas, op. cit., p.380.
[102] Claire Dunlop, op. cit., p.141.
[103] Lorraine Elliott, op. cit., pp.17-18.
[104] Mahinda Harischandra Parera, op. cit., p.90.

and recommendations produced by the Scientific Committee are consensual, allowing the advice to be argued down to the lowest common denominator. This consensual advice does not guarantee agreement in the Commission where political and economic interests can lead to recommendations being declined or amended. The amount of discussion about decision-making that occurs during the plenary sessions of the Commission is limited. More extensive discussions take place within SCAF, SCOI and in the margins of the meeting. The more political an issue the more likely it is that the issue will be discussed within SCOI, or some *ad hoc* group, rather than in the Scientific Committee.[106] This further limits the influence that the scientific community can have in policy selection. Informally members of the Scientific Committee can influence the position of their delegation in the decision-making process, and the Chair of the Scientific Committee is present during the Commission meeting. Representative observers from other IGOs would not usually form part of an epistemic community as they do not usually advocate for policy change in the ATS regime.

Elliott's analysis of the role played by epistemic communities in the ATS concentrated on two elements: "the consensual knowledge base of such networks and a degree of conscious policy advocacy."[107] In respect of intellectual leadership leading to the creation of CCAMLR Elliott found that "the scientists had begun to function as a nascent epistemic community."[108] The community was limited in its impact by the small number of scientists on delegations, and the overshadowing of scientific concerns by economic and political interests. On the whole Elliott was sceptical about the role played by any epistemic community in the ATS:

> In spite of concerns to protect the Antarctic environment, the environment regime was driven and shaped by political concerns rather than environmental ones. It was not primarily a knowledge-driven regime. Decision-making lagged increasingly behind knowledge and the scientific knowledge and advice which parties requested from SCAR, while crucial to the development of an effective environmental protection regime, was rarely accepted as the primary determinant of environmental rules. The scientific community, through SCAR, *did not function as an epistemic community.*[109]

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[105] Lorraine M. Elliott, op. cit., ibid., p.208.
[106] CCAMLR-XVI, 8.7, p.25 The usual procedure of following scientific advice was not followed, due to the political nature of the conservation measures being discussed.
[107] Lorraine Elliott, op. cit.
[108] ibid., p.92.

Elliott identified the scientific community and NGO organisations, as two different and sometimes competing groups. Because of the potential competition for funds and influence SCAR found the world park concept antithetical to the idea of free scientific investigation, and the Madrid Protocol was "received with less than full enthusiasm".[110] Parera may have identified an epistemic community within CCAMLR, without labelling it as such, for the period 1990-1991:

> Among the factors that most significantly affected the CCAMLR regime was the leadership of Australia in the coalition of non-fishing states that brought about the adoption of a conservation strategy to give effect to the CCAMLR regime's ecosystem objectives. The role of domestic and transnational groups in influencing the policy processes of both Australia and the CCAMLR regime was a significant factor.[111]

Environmental NGOs have been credited with playing a significant role in the development of environmental protection in Antarctica. Environmental NGO representatives can be included in CCAMLR delegations, and through ASOC in its role as an independent observer. The NGOs do have a network of professional members, many of whom are competent experts in scientific fields relevant to CCAMLR. Greenpeace has been active in scientific activities, in part to gain credibility for its statements and more acceptance as a legitimate actor in Antarctica and the Southern Ocean.[112] However, the NGOs often differ from the Scientific Committee in their conclusions about information.[113] This overlap in membership makes determining epistemic community membership problematic.

Analysing the discourse at CCAMLR meetings quickly reveals that it is extremely difficult to construct a simple division of the members into different epistemic communities. This is because in tackling the IUU fishing problem, CCAMLR is pursuing multiple solutions and the position taken by a state on one issue that might be categorised as 'pro-conservation', can be countered by that state taking a position on a different issue as 'pro-fishing'. The

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[109] ibid., p.208. Emphasis added.
[110] Mahinda Harischandra Parera, op. cit., p.82. At p.102 Parera comments on the irony that unregulated science reduces the value of science due to the impact of pollution, and on p.97 note 75 that some scientists welcomed the new environmental rigour that would preserve pristine conditions for research.
[111] ibid., p.253. See also pp.242-244.
[112] In 1986/87 Greenpeace established the World Park Base on Ross Island and maintained it for five years. http://www.greenpeace.org/~comms/climate/polartour/pt01.html, (site visited 31 January, 2002).
[113] For example NGO by-catch figures are higher because they assume that vessels involved in IUU fishing spend longer at sea in the Southern Ocean than the Scientific Committee does. Alan Hemmings Interview, 22 November 2000.

analysis is also heavily reliant on those statements which actually make it into the public record of the meeting. The informal and transient nature of an epistemic community makes it difficult to identify.

It appears possible to identify three different and competing epistemic, or epistemic-like, communities operating within CCAMLR at the time of the IUU fishing problem. Two of the epistemic communities are the 'fishing community', those states where the fishing interest is strongest, and the 'conservation community', where the conservation interest is strongest. This is very similar to the traditional analysis of most scholars about the division of interests within CCAMLR. The third epistemic-like 'environmental community' is represented by the environmental NGOs associated with CCAMLR, such as ASOC, IUCN, and Greenpeace, overlapping with those national delegations that include representatives from environmental groups. The presence of competing schools of thought may reduce their influence as consensus within the regime will be more difficult to achieve, but may also result in a more effective regime as more ideas may be considered.

Determining principled, normative, and causal beliefs

Determining the principled, normative and causal beliefs of an epistemic community is part of the process of identifying an epistemic community. The principled and normative beliefs within all the CCAMLR epistemic communities are to an extent those to be found within the ATS and CCAMLR regimes. The general ATS principles and norms include a commitment to peace and science in the Antarctic region, and the preservation of the sovereignty compromise that allows this.[114] One important point is that CCAMLR is a fisheries management regime operating within the ATS, rather an being than otherwise independent regional organisation.

For CCAMLR, the concept of rational use is a commitment to conservation and exploitation. It does not fence off the Southern Ocean as a world park, nor does it open the fisheries to limitless exploitation. The current belief is that the preservation of the ecosystem is to be achieved through a precautionary approach, with management of the resources relying on the best scientific advice provided by the Scientific Committee.[115]

[114] See Chapter 2, pp.10-15.
[115] See Chapter 4, pp.137-141.

Causal beliefs in the role of the relationship between the Committee and the Commission and how the scientific advice is to be used have developed over time. This was highlighted by the difficulties in the early period of CCAMLR when arguments supporting fishing outweighed those supporting conservation, culminating in a strengthening of the consideration to be given to the Scientific Committee's advice.[116] The difference between the fishing and conservation communities is that the conservation community was more precautionary in their approach when the data was anomalous in order to prevent possible damage, while the fishing community advocated continued fishing until the problem was proven.

These principles and normative beliefs are generally accepted by the NGOs involved in CCAMLR, although they pressure CCAMLR members to live up to its ideals and commitments. There are some different value-based rationales on issues such as sovereignty claims and the possibility of the exploitation of minerals in Antarctica, but the NGOs and other epistemic communities agree that sustainable exploitation of resources in the Southern Ocean should be possible, even if the scientific evidence that it can be possible for some stocks is still lacking. The distinction between conservation community and environmental community occurs because individuals in the conservation community are more committed to the principles and norms of the ATS regime than individuals drawn from the environmental NGOs. The NGOs are not as committed to principles such as ATCP dominance of Antarctic politics and the territorial sovereignty compromise, but they do generally accept the status quo of the ATS regime and work within it rather than to undermine it. NGOs are also wary about the effects of being socialised into the CCAMLR process, they act as 'outsiders' to the decision-making process, and while they advocate policy they are not in a position to take control of policy-setting. Members of the fishing and conservation communities should be in more of a position to take control of policy-setting.

The causal beliefs within CCAMLR epistemic communities in respect of the IUU problem have some points of agreement. Despite some initial disagreement over the extent of the problem there is now common agreement that the IUU problem is a serious one that undermines the credibility of the ATS and CCAMLR regimes. There is agreement that

[116] See Chapter 4, pp.133-135.

longliners are fishing in a way that threatens several species of seabird with extinction, and the commercial extinction of some stocks of Patagonian toothfish.[117] The presence of CCAMLR observers on fishing vessels makes it difficult for the fishing community to argue that the rate of incidental mortality is low.

The fundamental points of difference between the different epistemic communities lie in their responses to the problems of IUU fishing in the late 1990s. Members of the fishing community have generally taken a minimal response to the problem, preferring to work within the existing framework of measures and insisting on the expansion of legitimate fishing. Members of the conservation community have so far accepted the necessity of a legitimate fishing industry, but have attempted to expand the framework of conservation measures into new areas. While the environmentalists have supported new measures, they argue that they do not go far enough in tackling the problem, and have called for a moratorium on toothfish harvesting. These responses highlight different beliefs about how precautionary an approach CCAMLR should take, what conservation measures can be effective, and what conservation measures are legitimate for CCAMLR to take.

Tracing epistemic community activities

To trace the activity of an epistemic community is to attempt to trace the activities of individual people that can be identified as originating from that community. A number of areas in the development of conservation measures have been identified for investigation, and this should allow communities and membership to be identified through statements made. The public record of CCAMLR meetings does not allow every individual to be traced, although this record can be supplemented by interviews, press releases, NGO publications and other secondary sources. Within the Commission and Scientific Committee, statements are rarely linked with individuals, and in the Commission and SCOI statements are often identified to a particular state.

Individual delegations can be analysed to some extent in an attempt to place them in the fishing group or the conservation group. The size of most delegations is quite small with five or less delegates, although some states, such as Australia, Japan, and the United States,

[117] See Chapter 5, p.179 for a statement on incidental mortality, and p.185. for an estimate of damage to toothfish stocks around the Prince Edward and Marion Islands.

usually have larger delegations of ten or more delegates. Some states include environmental NGO representatives within their delegation, such as Australia, New Zealand, and the United States, but states are more likely to include representatives of their fishing industry in their delegation. The portion of the delegation drawn from fishing or environmental departments of a state's bureaucracy may also indicate whether fishing or conservation interests are favoured. For example Japan usually includes several industry advisers and no NGO adviser, while the United States usually includes both. Smaller delegations make it harder to categorise a state into an epistemic community, as among other things they have less opportunity to make statements.[118]

One problem is that the high workload and technical nature of the Scientific Committee's work has meant that over the years it has subcontracted work to several working groups, such as WG-EMM, and WG-FSA. The working group level is relatively opaque as environmental NGOs observers are excluded, and also because some of the data under discussion comes from commercial sources in confidence. This data is later made public in an aggregate form. The Scientific Committee now facilitates the flow of information between the different working groups to the Commission and its Standing Committees. Some environmental advocacy can come from the scientists of dependent species, such as seabirds.[119]

Karen Litfin's concept of knowledge-brokers could be useful in investigating the role of the chairs and vice-chairs of the Commission, the Scientific Committee, and the various Standing Committees and Working Groups.[120] The Executive Secretary and other positions within the CCAMLR secretariat are also potentially able to play a knowledge-broker role. The Chair of the Scientific Committee would seem important, as they are present at the Commission meeting and bear some responsibility for the Scientific Committee's report. The role of the Chair is to some extent constrained by the position, as they should be acting in the interests of CCAMLR, not just their state.[121] The limitation of this method is that

[118] See also the problems with the European Union in Chapter 5, pp.217-220.
[119] Alan Hemming interview, 22 November 2000.
[120] See Chapter 2, pp.34-35.
[121] According to the Rules of Procedure the Chair and Vice-Chair hold office for two meetings, and can be elected to a second term of office. In most cases this limits the term of formal authority to four years. The terms for the convenors of the working groups are not fixed, four years is considered appropriate, SC-CAMLR-XIII, 20.3-20.4, p.93. It is possible that an individual may chair a subordinate group before progressing further up, for example a Working Group Convenor may become chair or vice-chair of the

while it allows some tracing of activities it does not encompass the other informal relationships that can occur such as the informal drafting groups for conservation measures that occur during a Commission meeting. Delegates who are experienced with the ATS regime are more likely to be in a position to act as knowledge-brokers, as they will have the contacts and understanding necessary to influence how information is used. It is interesting to note that the chairs are distributed among the members so that they are not concentrated among any one group of members, either by geography or interest in harvesting or conservation.[122]

Politics is spread throughout the CCAMLR system and at no point does science alone decide what decisions are made. This increases the importance of the transformation rules of the CCAMLR regime. Arguments within working groups that lead to consensus being withheld from advice or data can flow all the way up the Commission. The Scientific Committee has on occasion been unable to gain a consensus on what level TAC should be set for a particular species, or SCOI has been unable to agree on a conservation measure, and the Commission has had to choose between different options. In these situations some delegates are more persuasive than others in the Commission and in the margins of the meeting.

Demonstrating epistemic community influence

Demonstrating the influence of an epistemic community on decision-makers is dependent in part on managing to trace the activities of that community. Epistemic communities should elucidate cause and effect relationships, and provide advice about results of a proposed course of action. It would be useful to identify the factors that give a specific epistemic community the upper hand. The process of doing this involves identifying credible alternative outcomes that were foreclosed, and exploring alternative explanations for actions.

Scientific Committee as happened with Denzil Miller, and a Vice-Chair can become Chair, for example Grant Bryden in SCOI.

[122] The Chair of the Commission is determined by automatic election, following in English alphabetical order from Australia, which held the chair at the first meeting, rules of procedure (footnote 2 to Rule 8). This means that there is not a struggle for the chair position between different factions in the Commission. If the chair is from a member not engaged in research activities then the vice-chair should be. In 1999 Russia was made Vice-Chair of the Commission in part because it would balance the chairmanship and vice-chairmanship in terms of Member harvesting activities, CCAMLR-XVIII, 14.1, p.55. This seems to be the

Epistemic communities should also shed light on issue linkage and the chain of events. Linkages are partly framed through problems elsewhere in the globe, as the problems of IUU fishing and incidental mortality are not unique to CCAMLR. Observers to and from other IGOs help exchange information on these issues and CCAMLR members can learn directly from participating in activities elsewhere. The environmental community has played a significant role in exposing the participation of CCAMLR nationals and companies in IUU fishing, and uncovering the details of how the IUU fishing activities are conducted in the Southern Ocean.[123] However, some of the fishing states have not been very helpful at identifying their nationals and companies that are involved in IUU fishing.

Epistemic communities should help define the self-interest of a state, In an international setting this may mean that a trans-national community is helping to define the self-interest of more than one state, or a group of states. There has been a reasonable degree of congruence in accepting that IUU fishing is a serious problem for CCAMLR, but the different epistemic communities disagree over the course of policy to be taken in many areas. The lack of accurate scientific models for ecosystem management makes it difficult for the conservation community to define state interests to support a precautionary approach, and the current interpretation of rational use makes it easier for the fishing community to persuade states to expand fishing efforts. So far CCAMLR is not controlling the problem of IUU fishing, so the contribution of the epistemic communities to the effectiveness of CCAMLR has been limited.

Rather than the Scientific Committee, or other parts of CCAMLR like SCOI or SCAF, forming an epistemic community, the different committees are more a forum where different epistemic communities attempt to gain the upper hand with their advice and arguments. Ideally it would be useful to trace the origins of a particular conservation measure through different drafts to the final adopted measure. This is limited by the availability of sources, and draft conservation measure documents are difficult to source. In this respect it must be noted that the bulk of discussion about contentious conservation measures takes place in SCOI or informal *ad hoc* groups, with the Scientific Committee to some extent being restricted to advice on TAC setting and 'alarm sounding' during the

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norm with the other chair positions in CCAMLR. Chair positions are held by countries, rather than individuals.

[123] See Chapter 5, pp.190-192.

IUU fishing debates. Four areas will be examined to illustrate the influence that epistemic communities may have had: VMS measures; the CDS; setting TAC; and the moratorium debate.

Debate on the VMS measures

VMS is useful in demonstrating the impact of epistemic communities because discussion on it predates the concern about IUU fishing that was prevalent from 1995 onwards. This analysis is based on an examination of statements made in SCOI and the Commission that allow the position of the members to be identified.[124] In 1993 CCAMLR began discussing whether the use of VMS would be helpful, and decided to acquire more information.[125] In 1994 the Secretariat was requested to conduct a feasibility study about using VMS in the Convention Area, and the Science Officer submitted a draft configuration of a CCAMLR VMS for consideration by SCOI at the 1995 meeting.[126] In 1995 there were three principle sources of opposition to the implementation of VMS.[127] One strand of opposition was over the possibility that it unduly interfered with freedom of navigation or flag state control of vessels. Another strand of opposition was related to the cost of implementation. The last strand of opposition was to the imposition of VMS in the krill fishery. This has been present in the VMS debate from 1994 through to 2000. In 1996 there was still no consensus on VMS implementation through CCAMLR, but SCOI urged national implementation in the Convention Area.

In 1997 the shock of IUU fishing to CCAMLR was obvious with the adoption of an item on the agenda for discussions relating to it.[128] SCOI became the centre of extensive discussions on a wide range of conservation measures, including VMS. Both the EC and Chile proposed VMS measures,[129] but only Resolution 12/XVI 'Automated Satellite-Linked Vessel Monitoring Systems (VMSs)' was adopted. The differences between it and the draft conservation measure D/XVI was that while D/XVI required VMS to be installed, Resolution 12/XVI requires an endeavour to install, and it further stipulates that VMS is not necessary in the krill fishery at the current time. The resolution also expanded on

[124] VMS is discussed in detail in Chapter 5 pp.205-207. See also Chapter 6, pp.237-238.
[125] CCAMLR-XII, Annex 5, 35-36, p.107.
[126] CCAMLR-XIV, 2.31, p.132, and 2.35, p.133.
[127] CCAMLR-XIV, 2.40-2.44, pp.134-135, and 2.51, p.136.
[128] CCAMLR-XVI, 2.1, p.2.

reporting and technical requirements present in the draft conservation measure. These changes do not appear to have been discussed in SCOI or the Commission, so the negotiations probably occurred in the margins of the meeting.

By the 1998 meeting many members had installed or were installing VMS in their national fisheries.[130] Australia and the EC submitted several proposals on VMS.[131] Australia attempted a draft conservation measure based on Resolution 10/XII with the aim of applying VMS outside the Convention Area to straddling stocks.[132] This measure did not progress towards adoption. However, Conservation Measure 148/XVII 'Automated Satellite-Linked Vessel Monitoring Systems' was adopted, but with an exception for the krill fishery. The reason for opposition remained the same; that the krill fishery was operating at a low level without unregulated activity.[133] This was seen the conservationist states as a serious flaw in the VMS conservation measure.[134] By the 1999 meeting most members had introduced or were committed to VMS.[135] Proposals by Australia and the EC to extend VMS to the krill fishery by 1 July 2000 were opposed by several states.[136]

The table below attempts to illustrate the different positions recorded in the CCAMLR record from 1994 to 1999. Type one support is a strong statement in favour of the introduction of VMS in the Convention Area. Type two support indicates that the member has either implemented VMS nationally, supports the introduction of VMS into the Convention Area, or has argued against a statement opposing the introduction of VSM. Type one opposition indicates the member had a reason to be opposed to VMS in the

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[129] CCAMLR-XVI, Annex 5, 1.64, p.133.
[130] CCAMLR-XVII, Annex 5, 2.26-2.34, pp.6-7.
[131] CCAMLR-XVII, Annex 5, 2.49, p.8.
[132] CCAMLR-XVII, Annex 5, 2.66, p.10, and CCAMLR-XVII, 5.40-5.41, pp.19-20. Without agreement in SCOI, the Commission restricted itself to encouraging members to make wider use of VMS in areas adjacent to the Convention Area. Australia also attempted to amend Conservation Measure 118/XVI 'Scheme to Promote Compliance by Non-Contracting Party Vessels', so that it was linked to the use of VMS, see CCAMLR-XVII, Annex 5, 2.69, p.10.
[133] CCAMLR-XVII, Annex 5, 2.50-2.53, p.9, and 2.67, p.10. See also CCAMLR-XVII, 5.34-5.37, p.19. Poland linked the discussion to a policy statement adopted at the recent meeting of the International Coalition of Fisheries Associations (ICFA). ICFA supported the introduction of a mandatory VMS on all vessels fishing in the Convention Area with the exception of vessels fishing for krill.
[134] CCAMLR-XVII, 5.38, p.19. "New Zealand stated its view that the introduction of mandatory VMS on vessels fishing for finfish, is a positive development. It nevertheless found it regrettable that it has not been possible for all countries to subscribe to the immediate introduction of VMS and that krill vessels have been excluded from coverage."
[135] CCAMLR-XVIII, Annex 5, 2.18, p.107.
[136] CCAMLR-XVIII, Annex 5, 3.13-3.24, pp.112-113, and CCAMLR-XVIII, 8.7-8.9, pp.30-31.

Convention Area, while type two opposition is a specific opposition to the introduction of VMS into the krill fishery.

Table 6

Position Statements made in SCOI and the

CCAMLR Commission in relation to VMS, 1994-1999

Year	Type 1 Support	Type 2 Support	Type 1 Opposition	Type 2 Opposition
1994		Australia Chile EEC New Zealand		Japan Poland Russia
1995	Australia New Zealand Sweden United States	France UK Norway	Argentina Chile Germany	Japan
1996	Australia New Zealand Norway South Africa United States	Argentina Chile EC France Spain Uruguay	Germany	Japan Poland Republic of Korea
1997	EC Chile	Argentina Republic of Korea Uruguay		
1998	Australia EC			Poland Republic of Korea Russia Ukraine
1999	Argentina Australia EC New Zealand Norway United States			Japan Poland Republic of Korea Ukraine

German opposition to VMS was based on reservations about the cost of implementing the system through CCAMLR.[137] Argentine and Chilean reservations in 1995 also derived from the disputed sovereignty claims in Antarctica.[138] Argentina can appear to have a weaker commitment to conservation, because the UK through its *de facto* sovereignty position within the Convention Area can and does initiate unilateral measures that Argentina is forced to challenge in CCAMLR. Without this dispute Argentina would

[137] CCAMLR-XIV, 2.53, p.136. Argentine and Chilean budgetary reservations are at CCAMLR-XIV, 2.44, p.135.
[138] CCAMLR-XIV, 2.41-2.43, p.134.

probably appear more on a similar level to Chile in its conservation stance in CCAMLR. A commitment to conservation can often appear reduced through the affect of maintaining a sovereignty claim. New Zealand, while interested in conservation, has appeared ambivalent at times through its efforts to enforce its sovereignty claim to the Ross Dependency. This is something that a simple division the CCAMLR states into fishing and conservationist factions can obscure. The EC support for VMS was limited by insisting on national application rather than any centralisation through the CCAMLR Secretariat. Spain is a fishing state, but its interests lie in longlining rather than the krill fishery, and its stance is also obscured by the EC.

Debate on the CDS measures

The other significant conservation measure that had difficulty in gaining acceptance was the catch certification scheme, which was eventually weakened and adopted as the CDS.[139] This proposal was initiated by the United States and Australia in 1998, and was inspired by the statistical documentation scheme of ICCAT.[140] In SCOI many members supported the idea, but there was concern about the application of conservation measures outside the Convention Area or within EEZs from some members.[141] The SCOI meeting time was exhausted before a revised measure could be discussed and the Commission discussions did not result in a consensus.[142]

It appears that at the April 1999 intersessional meeting that members of the fishing community were attempting to block the catch certification scheme. The meeting was a technical one rather than a policy-making one and some countries did not attend. At this meeting Japan blocked the presence of ASOC observers.[143] The EC presented a revised scheme which contained the compromises necessary to secure agreement from the states unwilling to impose trade controls. This is the point at which the certification scheme became a documentation scheme. Other informal intersessional work occurred. Dr D. Agnew from the UK chaired the Brussels session and the informal working group that drafted the CDS measure at the CCAMLR meeting later that year.

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[139] The CDS is discussed in detail Chapter 5 pp.187-188, 197-201, and Chapter 6, pp.238-240.
[140] CCAMLR-XVII, 5.16, p.17.
[141] CCAMLR-XVII, Annex 5, 2.46, p.8.
[142] CCAMLR-XVII, Annex 5, 2.47, p.8, and CCAMLR-XVII, 5.20, p.17.

The 'ministerial on ice' hosted by New Zealand in January 1999 appears to have played a significant role in changing attitudes towards the CDS at the ministerial level in many ATCPs.[144] There was substantial discussion of CCAMLR at the ATCM and it appears that the epistemic community advocating the CDS was active. The ATCM produced a resolution that strongly supported the implementation of CDS.[145] This 'wake-up call' meant that at the following CCAMLR meeting the CDS was a high priority item, and rather than being discussed in SCOI it was handled by a special open-ended working group.

Japan made the only statement that expressed serious reservations about the CDS and its agreement to the scheme was secured on the following grounds: "Firstly, the scheme should not be a trade restriction measure. Secondly, implementation of the scheme should not discriminate against non-Contracting Parties to CCAMLR. Thirdly, the scheme should be effective and not be problematic to Member States in regard to its implementation."[146] The final proposal was sponsored by Australia, the EC, and the United States.[147] Australia, the EC, New Zealand, Norway, South Africa, Brazil, and Chile made statements supporting the introduction of CDS.[148] Senator Hill and Tucker Scully were thanked for their efforts by New Zealand,[149] Brazil also thanked Senator Hill,[150] and France also thanked Tucker Scully.[151] Dr Agnew was thanked by the Commission.[152]

TAC measures

Most other conservation measures in response to IUU fishing were adopted swiftly. This makes it difficult to establish position differences between different states, and position change over time, as the quick adoption reduces the number of statements of agreement or disagreement left in the meeting record. However, one notable example of an idea that is

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[143] "Continuing Crisis in the Southern Ocean", *The Antarctic Project Newsletter*, 8 (2), July 1999, http://www.asoc.org/currentpress/jul99new.htm (site visited 27 March 2001).
[144] CCAMLR-XVIII, 5.14, p.13, Senator Hill was pleased at the support from CCAMLR Member Environment Ministers. See also Chapter 5, p.182.
[145] See Chapter 5, note 224, p.198 for the wording of the resolution.
[146] CCAMLR-XVIII, 5.22, p.17.
[147] CCAMLR-XVIII, 5.11, p.13.
[148] CCAMLR-XVIII, 5.14-5.24, pp.13-18.
[149] CCAMLR-XVIII, 5.17, p.14. Scully was also thanked in 1998 for his work in this area, CCAMLR-XVII, 18.1, p.91.
[150] CCAMLR-XVIII, 5.20, p.17.
[151] CCAMLR-XVIII, 5.24, p.18.
[152] CCAMLR-XVIII, 5.34, p.19.

yet to gain widespread support is the idea of the application of national measures. This appears to have only been supported by New Zealand and Norway, and has foundered on EC objections.[153] Many of the CCAMLR conservation measures deal with the regulation of legitimate fisheries, such as TAC allocation and new and exploratory fisheries. This has attracted sustained criticism from the environmental NGOs who ask why legitimate fishing is expanding when the state of the fisheries is so poor and CCAMLR control is so weak.[154] The recommendations made by the Scientific Committee about the TAC to be set for *Dissostichus* spp. in the 1998/99 season and the TAC set by the Commission are presented in the table below.

Table 7

Comparing Scientific Committee TAC Recommendation with the Commission 1998/99 TAC Allocation for *Dissostichus* spp. in tonnes[155]

Area	Scientific Committee TAC Recommendation	Commission TAC Allocation	Fishery Type
48.1	Prohibition	Prohibition	-
48.2	Prohibition	Prohibition	-
48.3	Less than 3,616	3,500	Longline
48.4	28	28	Longline
48.6	707 North of 60° S 495 South of 60° S	707 North of 60° S 495 South of 60° S	New Longline
58.4.1	261	261 West of 90° E	Exploratory Trawl
58.4.3	2,438	700 North of 60° S	New Longline
58.4.3	886	625	Exploratory Trawl
58.4.4	572 (Longline) 314 (Trawl)	572	New Longline
58.5.2	3,690	3,690	Trawl Fishery
58.6	3,993 (Longline) 1,054 (trawl)	1,555 (outside EEZ)	Exploratory Longline
58.7	688 (Longline) 182 (trawl)	Prohibition	-
88.1	271 North of 65° S 2,010 South of 65° S	271 North of 65° S 2,010 South of 65° S	Exploratory Longline
88.3	Prohibition	Prohibition	-

[153] This is discussed in Chapter 5 pp.196 and p.218.

[154] "Until IUU fishing is brought under control, ECO believes that CCAMLR has no option but to adopt a moratorium on the legal fisheries for both Antarctic and Patagonian toothfish. It makes no sense at all to be conducting 'legal' fishing when the real catch is already so far above what CCAMLR estimates as a precautionary level.", *Eco*, 'Precautionary Approach — Moratorium On Toothfish Fisheries The Only Option', CCAMLR XVIII, No 1, Hobart, Australia, 25 October, 1999, http://www.asoc.org/currentpress/ecodoc.htm, (site visited 31 January, 2002).

[155] Compiled from SC-CAMLR-XVII and CCAMLR-XVII.

The Scientific Committee was aware that it was operating in conditions of uncertainty, and it was not even known if Patagonian toothfish were a contiguous stock or not. The discount factor for *D. eleginoides* was 0.45 and for *D. mawsoni* it was 0.30.[156] The Scientific Committee: "emphasised that there was no scientific basis for selecting a particular value for any discount factor .... Despite these uncertainties, the Scientific Committee agreed that the methods used to calculate precautionary catch limits were the best available given existing information."[157] This helps explain why the third issue of ECO at that meeting was entitled "Introduction to CCAMLR Science 101: Plucking Numbers Out of a Hat".[158]

In 1999 the Scientific Committee found the GYM model to be producing yields that were in excess of precautionary levels due to flawed methods and assumptions.[159] Four main options were considered for establishing precautionary catch levels by the Scientific Committee:

(i) use this year's assessments by WG-FSA as a guide to setting precautionary catch levels, particularly for *D. eleginoides* (Table 7);

(ii) recommend that the catch levels adopted by the Commission last year should remain until more information is available (Table 7);

(iii) identify a maximum catch for each statistical area that would enable the conduct of the fisheries-based research plan in the SSRUs in that area; or

(iv) recommend zero catches until fisheries-independent research is undertaken to provide sufficient data for an assessment.[160]

The figures developed by WG-FSA could not be recommended to the Commission and an informal group discussed the numbers in the Scientific Committee.[161] Normally figures agreed on at WG-FSA pass through the Scientific Committee, where corrections to mistakes can be made, and then pass on to the Commission where they are incorporated into conservation measures. Considerable effort was being given to refining the methods

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[156] SC-CAMLR-XVII, 9.40, p.57.
[157] SC-CAMLR-XVII, 9.41-9.43, p.57.
[158] *ECO*, 'Introduction to CCAMLR Science 101: Plucking Numbers Out of a Hat', Volume CXXXVIII No. 3, Hobart, Australia, 2 November 1998, http://www.asoc.org/currentpress/ccamlr98eco3.htm, (site visited 31 January 2002).
[159] SC-CAMLR-XVIII, 9.15, p.52, earlier doubts were expressed in 1998, SC-CAMLR-XVII, 5.47-5.48, p.28.
[160] SC-CAMLR-XVIII, 9.44, p.57. The table 7 referred to here should not be confused with table 7 on the previous page.
[161] SC-CAMLR-XVIII, 9.15-9.16, p.52, and 9.24, p.53.

used by WG-FSA,[162] but at that time they were still inadequate. The environmental NGOs have criticised CCAMLR for continuing to set TAC rather than adopting the fourth zero catch option suggested by the Scientific Committee.

The moratorium debate

The moratorium debate has been conducted mainly between the fishing and environmental communities.[163] Recommending a zero catch limit was among the options available to the Scientific Committee, however a prohibition of directed fishing for toothfish has only occurred in those areas where the stock is not present, such as Subarea 88.3 in the Pacific Ocean, or where it is known to have been fished out, such as Subarea 58.7 near the Prince Edward and Marion Islands. Even in the other areas where IUU fishing has been occurring, the Commission has continued to set TACs, choosing to believe that its conservation measures will bring IUU fishing under control. ASOC and Greenpeace have been calling for a zero catch limit, or a moratorium, on toothfish from 1997.[164] To date only one CCAMLR member, New Zealand, has appeared to consider advocating the moratorium concept within CCAMLR, and that support is predicated on the outcome of the 2000/2001 fishing season.[165] In 1998 and 1999 the efforts of the conservation community members focused on gaining acceptance for first VMS and then the CDS conservation measures, with efforts in 2000 focusing on strengthening these measures rather than supporting a moratorium. It would appear that the chance of a moratorium being implemented before the reduction of the remaining toothfish stocks is low. One development in the debate at the 2000 meeting is the acceptance in the Commission that it is enforcement vessels rather than those of the legitimate fishing operators that possess deterrence capability,[166] which may weaken future arguments put forward by fishing community members.

Influence of the epistemic communities in CCAMLR over IUU fishing

What is the influence of the different epistemic communities in CCAMLR in the areas of policy innovation, policy diffusion, policy selection, and policy persistence? In the area of

[162] SC-CAMLR-XVIII, 5.54-5.57, pp.28-29, 6.25-6.34, pp.43-44, and 7.11-7.23, pp.47-49.
[163] Chapter 5, p.186, and pp.224-287.
[164] CCAMLR-XVI, 12.9, p.74.
[165] See Chapter 5, pp.226-227.
[166] CCAMLR-XIX, 5.5, p.19.

policy innovation the conservation community is more innovative than the fishing community. This is partially due to the structure of the transformation rules and intellectual order of CCAMLR as conservation community members have to demonstrate that regulations or restrictions on activity are necessary, while the fishing community members have benefited from defending the status quo of default fisheries access. The statements made by members of the conservation and environmental community have framed the political controversy, and the proposals for new conservation measures. The fishing community members have largely reacted to these proposals, defending status quo positions with established arguments, such as Japan's insistence that VMS is not required in the krill fishery because adequate information is already being provided and there is no proof of IUU krill fishing.[167] Ideas about technical solutions to incidental mortality problems appear to have mainly originated in those states where conservation and fishing interest is strong.[168]

The defining of state interests in reaction to the problem of IUU fishing has focused in three interrelated areas. The first of these is that the threat posed by IUU fishing to toothfish stocks and populations of endangered seabirds is undesirable on the grounds that extinction of species is undesirable. This is most likely to be an interest of the states that strongly support conservation. The second of these is that a failure to manage the problem effectively will lead to a loss of credibility for CCAMLR and the ATS, possibly leading to the undermining of the ATS or the replacement of CCAMLR with a new regime. This interest is shared by the existing members of the CCAMLR and ATS regimes, although less strongly among the environmental NGOs. The third area of interest is in continued rational use of the resources, because if the toothfish stocks become commercially extinct then they can not be sustainably used. While some fishing operators may be attempting to make a quick profit, the fishing states in CCAMLR profess to being interested in sustainable fishing in the Convention Area. There is a reasonable degree of common ground between the different epistemic communities that there is an IUU fishing problem and that something should be done about it.

[167] CCAMLR-XVIII, Annex 5, 3.18, p.113.
[168] New Zealand and Norway were investigating devices for underwater setting of longlines, CCAMLR-XVI, 6.51, p.19.

The environmental community members have attempted to set higher standards, or at least argue for CCAMLR members to live up to the standards which they have set previously. The 'best practice' of New Zealand for incidental mortality is a three sea bird by-catch limit in the Ross Sea,[169] while the NGOs ask for a zero by-catch limit on sea birds.[170] Environmental NGOs make reference to the ecosystem approach and the precautionary principle and the fact that CCAMLR members do not appear to be living up them.[171] The new conservation measures being implemented by CCAMLR appear to be more of an attempt to live up to existing standards than an attempt to develop a new level of attainment for the objectives of the Convention. CCAMLR is unlikely to adopt a new environmental standard that does not allow exploitation of the living marine resources, as evidenced by the negative reaction of fishing community to suggestions for an MPA around the Balleny Islands both in CCAMLR and at the ATCM.[172]

Tracking policy diffusion requires attempting to track the exchange of ideas and where ideas are adopted into policy. This is difficult because of the ease with which electronic information can now be globally diffused, although not all governments have the capacity to benefit from this. To a limited extent ideas can be tracked through statements and the information papers at CCAMLR meetings. Outside of these meetings policy diffusion occurs through the environmental NGOs and the meetings and work of other IGOs. Although the fishing industry is eager to exploit any new fish stock this is counterbalanced by the commercial incentives for secrecy that impede the flow of information between different fishing operations. With the proliferation of other regional fishery and conservation bodies, and the organisation of specific international efforts to deal with

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[169] New Zealand was willing to accept a maximum incidental mortality of three sea birds in Subarea 88.1 in Conservation Measure 210/XIX.

[170] In their 2000 report to the Commission ASOC submitted: "that all fishing methods that contribute to seabird mortality must be prohibited.", Report of the Antarctic And Southern Ocean Coalition (ASOC) to the XIX Meeting of the Convention on the Conservation of Antarctic Marine Living Resources, Hobart, 2000 http://www.asoc.org/ASOCreport.htm, (site visited 1 February, 2002).

[171] ibid., "CCAMLR was founded on the basis of adherence to the precautionary principle, yet fisheries have continued to be agreed to as a political accommodation, rather than as a considered response to the state of the fishery."

[172] ibid., "ASOC understands that the Working Group on Ecosystem Monitoring and Management was unable to reach consensus on endorsing the Balleny Islands Protected Area proposed by New Zealand. We are concerned that this had more to do with concerns over limiting potential fishing areas than with the scientific and environmental merits of the proposal. The ricocheting of this proposal between CCAMLR and Antarctic Treaty fora, without apparent substantive progress towards the designation of the area, demonstrates a serious institutional failing within the Antarctic Treaty system." Conservation Measure 210/XIX bans fishing for toothfish within ten nautical miles around the Balleny Islands – a distance of twelve nautical miles was rejected for being too territorial, Personal Notes, Felicity Wong GCAS Lecture, 13 January 2000.

problems of fishing overcapacity, incidental mortality, and IUU fishing, CCAMLR operating in an interdependent world. Several of the conservation measures adopted by CCAMLR in response to IUU fishing were inspired by efforts in other IGOs. CCAMLR was in part responsible for the diffusion of the idea of the ecosystem approach and the precautionary principle, but does not appear to have been at the forefront of innovation with IUU fishing. IGOs can be important in developing technical solutions and communicating ideas between states, while NGOs are able to operate transnationally and help spread ideas into the domestic arena.

The consensus based decision-making system used in CCAMLR is crucial to understanding which political factors allow an epistemic community to have their ideas adopted in CCAMLR. This is because the size of a winning coalition that supports a new idea has to include almost all of the CCAMLR members, while a blocking coalition only has to attract the support of a few members. The presence of the reservation system makes it difficult for one member by itself to block measures in CCAMLR. The CDS measure that was blocked in 1998 was adopted in 1999 because the reservations of the fishing states were overcome through compromises. The scope of the CDS was reduced from a verification scheme to a documentation scheme, and Australia and the United States did not proceed with a CITES listing for the Patagonian toothfish.[173]

The VMS measures adopted by CCAMLR are all potentially ineffective because of their lack of application to krill vessels, but this compromise was necessary to secure the support of fishing states. There is a continuing effort to improve the VMS coverage from conservation group members. The fishing states may be attempting to preserve a bargaining chip for use in future negotiations over TAC allocation for krill. If krill fishing does expand, then the fishing states will need new arguments to delay VMS implementation in krill vessels. One condition for epistemic success may be that an idea has to appeal to a winning coalition in the decision-making body or group. One limiting factor on policy adoption at a CCAMLR meeting is that delegations to CCAMLR are subject to established goals and instructions. Within the time frame of a CCAMLR meeting altering these goals can be difficult. A delegation that exceeds its instructions and makes

[173] See Chapter 5, note 230, p.199, and *Greenpeace Critique of the CCAMLR Catch Documentation Scheme [1999] as a Mechanism to Prevent Illegal, Unregulated and Unreported Fishing For Toothfish Species in the Southern Ocean February*, 2000, http://www.greenpeace.org/~oceans/reports/ccamlarcritque.pdf, (site visited 1 February, 2002).

commitments that its state is unable to live up, could see the state exercising the objection procedure. This may be a reason why controversial measures take more than one meeting to gain acceptance.

Flag state measures for increasing compliance from nationals and companies have been advocated by Norway, and supported by New Zealand and the environmental NGOs, but no progress was made here until 2000 when Resolution 13/XIX, 'Flagging and Licensing of Non-Contracting Party Vessels' was adopted. Even members which strongly supported other conservation measures were reluctant to back these measures. This was perhaps because they were too radical a departure from existing notions of what was acceptable for flag-state measures in relation to vessels operating on the high seas. However the resolution adopted in 2000, following up from actions in other IGOs may indicate a broader social change in acceptable flag-state ideas. One condition for epistemic community success may be that a new concept can not depart too radically from the existing intellectual order of what is acceptable, at least for a minor shock like IUU fishing.

A crisis may allow greater departures from existing norms and values. Although the IUU fishing problem is a continuing problem for CCAMLR, part of its initial impact has now passed and it is a 'business as usual' problem, and the idea of a moratorium is not being widely advocated. Although the precautionary principle should deal with the problem of uncertainty by the implementation of cautious catch limits, the uncertainty in the Scientific Committee's assessments of the problems and solutions allows the fishing community to argue for continued access to the fisheries. A similar problem with krill would pose a more significant threat to the entire ecosystem and a moratorium could attract stronger political support. For example, groups like Greenpeace would be able to highlight the connection between Baleen whales and krill. A factor in epistemic success is the domestic support that the idea can attract, and some ideas will attract more support than others. The environmental NGOs have focused their publicity campaigns on the sea birds of the Southern Ocean in part because they attract more public empathy than the toothfish.[174]

Policy acceptance in CCAMLR appears to take its final form based less on epistemic consensus or even scientific information, and more on commercial interests and political

[174] This has been called the 'Albatross factor'. Personal Notes, Alistair Graham Lecture, 22 June, 2000.

bargaining at this stage of its development. Members of the conservation community are willing to trade off access to fisheries for some progress towards attaining conservation goals, while members of the fishing community are willing to allow slow progress as long as exploitation of the resources continues. The environmental community call for a moratorium may tilt the bargaining in favour of the conservation group through shifting the middle ground of the zone of agreement, but 'horsetrading' of TAC and state access to new and exploratory fisheries continues. The introduction of more accurate ecosystem models may strengthen the role of scientific information in the policy process in the future.

Although CCAMLR has adopted 215 conservation measures in the period from 1982 to 2000, only 58 conservation measures remain in force in the 2000/2001 season. This allows policy persistence to be analysed to some extent as measures are revised, dropped, or replaced. CCAMLR now generally performs well at gaining feedback on problems with its conservation measures and making minor adjustments to improve measures where necessary. Despite the fact that measures have to be renewed annually, conservation measures have generally stayed in place until replaced by an amended measure or changing conditions that rendered them obsolete. This reflects well on the 'spirit of cooperation' among the CCAMLR members, as once in place attempts are not made to remove measures. Although the change in the system is slow, it is not prone to taking steps backward. Because conditions of uncertainty persist, fostering dissension rather consensus over some scientific questions, there is room for substantial change and modification of the framework of CCAMLR conservation measures in the future. One policy that has persisted through the IUU fishing problem is the TAC allocation system in the new and exploratory fisheries conservation measures.

Epistemic community summary

The Scientific Committee acts less like an epistemic community and more as a forum for different epistemic communities to express dissent. Three different epistemic communities can be tentatively identified within CCAMLR: the environmental community, the conservation community, and the fishing community. The contribution to problem-solving effectiveness by the epistemic communities is limited by the lack of consensus between communities. This is because of the differences in principled and causal beliefs between the members of the different communities, which lead to the different communities making

different interpretations of the uncertain conditions that CCAMLR is experiencing with IUU fishing. Consequently, while the communities have generated information, elucidated relationships, provided advice, and helped states to define their interests, the different communities have been working at cross-purposes to each other.

The different communities have had mixed success in their influence on CCAMLR policy. The fishing community has kept access to the fisheries open by maintaining a traditional interpretation of rational use that supports continued exploitation, but has contributed little to problem-solving effectiveness or learning. The conservation community has managed to implement limited change in CCAMLR policy in support of conservation. The environmental community has been unsuccessful in getting a moratorium policy adopted, but has played an important role in increasing regime transparency and in generating the public support that gave the conservation community the political clout it needed to reach a compromise with the fishing community over new conservation measures. Traditional interest group politics in combination with the consensus based decision-making procedures of the ATS regime can prevent epistemic communities from influencing policy decisions in CCAMLR. Environmental groups appear to be as capable as groups of professional experts at participating in epistemic communities. Tracking key individuals and their activities is easier than tracing the influence of a network of professionals, but the knowledge-broker concept still has some of the same operationalisation problems that epistemic communities have.[175]

In drawing linkages between epistemic communities and the determinants of effectiveness, some determinants are more relevant than others. The nature of the ATS regime issue area is such that science has traditionally played an important role, so it seemed reasonable to anticipate that epistemic communities could generate ideas and learning that would translate into increased government capacity through the use of epistemic power. In practice the existing intellectual order and transformation rules of CCAMLR impede the use of espitemic power in support of solving the problems of IUU fishing and incdiental mortality. Fishing states have been able to use their epistemic power to maintain access to the new fisheries in the Southern Ocean. However, the actions of non-state actors in the

[175] It will be interesting to see the impact of the appointment of Dr. Denzil Miller, formerly Chair of the Scientific Committee, to the position of Executive Secretary for CCAMLR from February 2002, http://www.ccamlr.org/English/e_ccamlr_news.htm, (site visited 5 February, 2002).

environmental community have been important in increasing regime transparency, which has had the flow on effect of increasing the ability of conservationist states to introduce new conservation measures as their political capacity in this issue area has increased.

CCAMLR: Regime Change

Does theory explain the key dimensions of regime change in the case of the CCAMLR regime? The four theoretical models developed by Keohane and Nye will be used here to analyse the CCAMLR regime.[176]

The economic process model

The main economic development that has threatened the CCAMLR regime has been the advent of IUU fishing in the Southern Ocean. The origins of IUU fishing are diverse, but stem from the initial development of fishing in the Southern Ocean and the introduction of technology that makes fishing for toothfish practical.[177] This fits well with the first premise of the economic process model. The second premise fits less well, as while some CCAMLR members interested in fishing appear motivated to protect their domestic standard of living, other CCAMLR members are more interested in conservation and appear willing to sacrifice demands for a rising standard of living in order to preserve the environment of the Southern Ocean. The main economic benefit that gives an incentive to modify the CCAMLR regime to be effective in dealing with the problem of IUU fishing, is the promise of a sustainable harvest from the fisheries of the Southern Ocean, a harvest which is threatened by the unsustainable nature of IUU fishing. This fits well with the third premise of the economic process model. The model predicts that regime change will be a process of gradual adaptation to the economic activity of IUU fishing, and this has a good fit with the slow introduction of the VMS and CDS conservation measures by CCAMLR.[178]

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[176] See Chapter 2, pp.37-40 and pp.54-55.
[177] See Chapter 3, p.98, and Chapter 5, pp.188-189.
[178] For more detail on this see Chapter 6, pp.282-286.

The overall power structure model

The power structure of the ATS and CCAMLR regimes is to some extent the product of the Cold War, when the United States and the USSR were superpowers. The ATS regime as a whole has significant impediments to the application of military power by restricting the military role in Antarctica to providing logistic support for scientific activities.[179] The end of the Cold War and the decline of Russian power has not had a significant impact on the rules of the ATS and CCAMLR regimes. The overall power structure model is unsatisfactory in explaining what regime change has occurred in CCAMLR in response to the problem of IUU fishing. Although the United States has exercised leadership on this issue, this has been dependent on the ability of its delegates rather than on any application of military power.[180]

The issue structure model

This model predicts that the states with issue-specific power will be most influential in making rules. Some of the issue-specific sources of power in relation to IUU fishing and the CCAMLR regime include: geographical proximity of port states, existing EEZ jurisdiction, commitment of enforcement capabilities, control over the level of fishing effort, and control over issue-specific information and its uses. These have changed in the 1990s as fishing effort in the Southern Ocean has increased, followed by a greater commitment of enforcement capability within EEZs. To some extent change in the CCAMLR regime has been driven by states dissatisfied with how CCAMLR has handled the problem of IUU fishing. However, the consensus-based decision-making procedures of the CCAMLR regime make it difficult for any state to use power resources to force change, but comparatively easy for states to impede change. The bargaining process in CCAMLR has led to a pattern of outcomes where compromise leads to the introduction of conservation measures of limited effectiveness in dealing with the problem of IUU fishing. Another problem with the issue structure model is with the fact that issue-linkages have

[179] See Appendix I, Antarctic Treaty, Article I.
[180] One example of this was the role played by Tucker Scully. See Chapter 6, note 88, p.267, and p.286.

been successfully drawn by both the fishing and conservationist states to different issue areas.[181]

The international organisation model

This model predicts that the power resources used to determine regime change will depend on organisationally dependent capabilities, such as voting power, coalitions, and elite networks. The consensus based decision-making procedures of the CCAMLR regime are important in explaining regime change, or in this case, regime inertia. The existing norms favour exploitation of the living marine resources of the Southern Ocean, and this has impeded efforts at dealing with the problem of IUU fishing. These norms could be changed by a shift in coalitions, or the development of a consensus among the different epistemic communities, but this is yet to develop. One part of the model is that other international organisations will be a source of regime change, and this is true to an extent for the CCAMLR regime, as many of the conservation measures implemented by CCAMLR were first trialed in other international organisations, or by members in their domestic jurisdiction.

Regime change summary

The least useful of the four models of regime change was the overall power structure model. The economic process model is good at illustrating the initial causes that drive regime change, but the issue structure and international organisation models are better at explaining the exact process by which regime change has occurred in the CCAMLR regime.

CCAMLR: A Regime in Decline?

One form of regime change is change that leads to the decay or decline of a regime, possibly leading to the dissolution of a regime. The effectiveness of CCAMLR in solving

[181] For example, the EC drew attention to the rejection of flag state measure proposals by other regional organisations such as NAFO as part of its arguments against Norway's proposals. CCAMLR-XVIII, Annex 5, 2.45, p.111.

the problems of IUU fishing has been limited, and while it remains the legitimate regime in its issue area, there are some 'triggers' that could initiate a collapse of the regime. Is CCAMLR a regime in a state of decline or decay? What are the potential consequences of this situation?

Defining decline and decay

A regime may be in a state of decline when its process and goal effectiveness does not fit well with actual problem-solving effectiveness.[182] For CCAMLR this means that although it may be adopting conservation measures that maintain the compromises that were necessary for the creation of the regime, it is failing to effectively deal with current problems such as IUU fishing. A regime may be in a state of decay when it starts failing to meet process and goal effectiveness solutions because its problem-solving has been ineffective. For CCAMLR this might be indicated by a paralysis in its decision-making procedures, significant unilateral actions by sovereignty claimants in Antarctica or other disputed territories within the Convention Area, or if the incidental mortality becomes irreversible for some dependent species threatened with extinction. Currently CCAMLR could be considered to be in a state of decline, although there is the risk of *post hoc ergo propter hoc* problems in making such a judgement, as a regime could only judged to definitely be in a state of decay when it actually starts collapsing.

Christopher Joyner has listed several areas that could cause the ATS to stagnate, resist and decay, but he does not explore these issues in great depth.[183] One area is that persistent pathological conflict could destroy the reason for the existence of the ATS regime. Another area is where a steady degeneration of the operation of the ATS could lead to frustration in policy, disorganised planning, and increasing non-cooperation. Joyner points out that the ATS has often undergone periods of creative tension where the ATCPs have been able to transform conflict into productive change for the regime. If the process can be repeated again with CCAMLR and the IUU fishing problems then the ATS regime should be strengthened. Joyner argued that agreements within the ATS had to mesh their design to attain the objectives common to the regime. This obviously limits the degree of change that is possible for CCAMLR. If CCAMLR were to adopt measures that increased the

[182] See Chapter 2, pp.28-29.
[183] Christopher C. Joyner, op. cit., pp.95-96.

effectiveness of the CCAMLR regime at the cost of the stability and effectiveness of the wider ATS regime, then these measures could be ultimately self-defeating. This is an unlikely scenario because the key provisions of the Antarctic Treaty are embedded within the Convention.

The consensus decision-making procedure has a limited process and problem effectiveness. There is a consensus in CCAMLR about the severity of the IUU shock and the extinction dangers, but there is a disagreement over the best solutions to the problem among the different epistemic communities.[184] Some conservation measures have achieved consensus, but often the bargaining that has resulted in the consensus has left a critical defect in the measure, such as the fact that VMS does not include the krill fishery, and that the CDS does not impose strong market end obligations to reject uncertified fish. Other areas, such as the application of stronger national measures or a moratorium, have been blocked. This means that CCAMLR has not yet emerged from the period of creative tension. There is still room for more conservation measures to strengthen the regime, and there is still the opportunity for resistance to cause a stagnation in problem-solving effectiveness that can undermine the regime and transform a period of decline into a state of decay. The CDS and VMS conservation measures represent one area where a majority based decision system might have resulted in more rapid acceptance and implementation.[185] This is qualified by the point that fishing states would have a lesser obligation for compliance under a majority decision where they were in opposition, and could lead to more use of the objection procedures for opting out of a conservation measure.

CCAMLR is still the legitimate authority for the Southern Ocean, and the accession by Namibia and Vanuatu indicates successful expansion of membership while the regime was under stress. Although there is a questionable degree of compliance with CCAMLR conservation measures by some members,[186] the CCAMLR members remain committed to the regime. External criticism from the states that were previously critical of the ATS regime when it was negotiating CRAMRA has not been a problem for CCAMLR. The fact that some developing states have been connected to the IUU fishing problem may

[184] See Chapter 6, p.281.
[185] See Chapter 6, p.255.
[186] See Chapter 5, pp.190-192.

contribute to this – but it is peculiar that critics like Malaysia have not made greater use of this opportunity to criticise the non-compliance by CCAMLR member nationals. If criticism did develop through the UN and other forums, then this might add to the pressure on CCAMLR members to deal effectively with the IUU problems rather than risk the chance of CCAMLR being replaced with a new non-ATS regional fisheries management regime.

A major renegotiation of the Convention should not be anticipated while it is under pressure from IUU fishing. Although the regime has flaws, its members do not contemplate attempting to replace it with a new regime. This would be too risky with the potential for problems arising from economic pressures in areas with disputed sovereignty claims. Unlike the Antarctic Treaty or the Madrid Protocol, the CCAMLR regime does not have the formal possibility for a review conference. The members have to make the current system work if the credibility of the CCAMLR and ATS regimes is to be maintained. It was less difficult to negotiate the Madrid Protocol after CRAMRA was derailed because mining activities, apart from basic geological research, had not started in Antarctica. Negotiating a new regime for marine living resources in the Southern Ocean would be difficult with existing commercial pressure on the resources. Continued difficulties with CCAMLR may affect considerations given towards developing frameworks for handling other efforts for commercial use of Antarctica, such as privately conducted tourist and science operations.

The reasons for the creation of the ATS regime and its sub-regimes remain valid. Sovereignty is the issue that could most likely unravel the ATS regime, followed by economic interests and then conflict over environmental issues. CCAMLR has the potential to become a self-maintaining 'dead letter' regime if the fisheries problems are not dealt with effectively. One slow change in technology is the steadily improving access to Antarctica and the Southern Oceans. Commercial enterprises are now able to operate profitably in a region where once only governments used to operate. Before CCAMLR entered into force the overexploitation of fishing stocks occurred under fishing fleets that were significantly subsidised by their governments. The exploitation that is occurring today is to a much greater extent conducted by fishing fleets operating without subsidies from their governments.

A litmus test for the CCAMLR regime may be the use to which the EEZ concept is put. A new declaration of an EEZ from a sovereignty claimant in Antarctica would indicate strongly that the claimant believed that CCAMLR was sufficiently ineffective that the risk of upsetting the ATS was worth the unilateral action to protect the environment. The reaction to this by the other ATS members, and to a lesser extent the reaction from third-parties that do not support sovereignty claims to Antarctica, would be crucial in determining what happened next. In this situation CCAMLR would be in a state of decay as large parts of the Convention Area would potentially be excluded from conservation measure application. If the current situation continues, where EEZ have largely been undeclared in Antarctica or are not currently enforced, then CCAMLR is either being sufficiently effective to satisfy the claimants, or the claimants judge that the cost of such an action is not worth it. In this situation the CCAMLR regime might still be in a state of decline. Other signals from members that indicate the CCAMLR regime may be in a state of decay include: exercising reservations rather than joining a consensus; or using the objection provision to opt out of a conservation measure; members not attending meetings; members not making an effort at meetings to solve problems; or withdrawal from the Commission. Signals from outside the regime that indicate decay in CCAMLR may include: external pressure from third-party states, or from other international regimes; and progress in other regimes that bypasses CCAMLR efforts. The last point is interesting in light of the decision of twelve states to coordinate on protecting seabirds in the Southern Ocean with an agreement on the Conservation of Albatrosses and Petrels.[187] This could result in more problem solving effectiveness in respect of incidental mortality but possibly not carried out within the framework of the CCAMLR regime.

The consequences of collapse

The consequences of an outright collapse of the CCAMLR regime would be serious. Without international regulation and with the continued presence of IUU fishing, the SORS would have strong incentives to consider unilateral enforcement, such as the establishment of EEZ and other actions that would undermine the sovereignty compromise that underlies the entire ATS regime. The ATS may be undermined even if an ineffective

[187] Senator the Hon Robert Hill, "Brighter Future for Endangered Albatrosses", http://www.environment.gov.au/minister/env/2001/mr6feb01.html (site visited 7 March, 2001) and Hon Phil Goff, "Government to Consult Over Safeguarding Petrels and Albatrosses", http://www.executive.govt.nz/speech.cfm?speechralph=33638&SR=0 (site visited 12 March, 2001).

CCAMLR regime is maintained, but the loss of CCAMLR would be a serious blow to the ATS. Awareness of these negative consequences increase the incentives for the members to keep the regime together by compromising, but it is questionable if this is enough to make the regime effective. If the regime continues to be ineffective at solving its problems the cost to the SORS for inaction will rise.

A CCAMLR regime collapse would affect the conduct of science and the benefits that the internationalisation of Antarctic and Southern Ocean science has allowed to develop. Commercial pressure already exists on information sharing principles,[188] and an unwillingness to share propriety information could undermine the sharing of scientific information that has been a hallmark of the ATS. One important part of CCAMLR is the sharing of data obtained by commercial interests 'in confidence' to the Scientific Committee and the Commission for their use in decision-making about the Southern Ocean.[189] A collapse of CCAMLR, would disrupt the accumulation and analysis of data necessary for good science and the development of effective conservation measures.
CCAMLR can not be treated in isolation, in addition to being a fisheries organisation that is part of the ATS regime, it is also part of the growing network of global fisheries organisations and other associated environmental regimes. The new international agreements negotiated to deal with overcapacity and exploitation problems in the 1980s demonstrate that these organisations do not work in isolation.[190] The international fisheries regimes face similar problems in different areas and these problems can have common solutions. The growing web of fisheries regimes is not conducive to global failure, if CCAMLR fails in the short term it may learn from other regimes, or be replaced by an FAO agreement outside the ATS, or a new ATS driven regime.

Visualising regime decline

There have been some pessimistic assessments of CCAMLR in recent years as the IUU problem has grown. In 1997 Victoria Hallum feared that CCAMLR would go through the motions "expressing concern, making various proposals, and adopting weak and ineffectual measures, but continuing to ignore the real issues. While all this is going on the

[188] The United States took information on sea ice conditions off the world wide web for fear of IUU fishers utilising it. Personal Notes, Felicity Wong GCAS Lecture, 13 January 2000.
[189] See Chapter 4, p.131.
[190] See Chapter 3, pp.89-95 for a summary of environmental trends.

unsustainable onslaught will persist and the species that the regime is supposed to protect will continue to dwindle, dying 'not with a bang but a whimper."[191] In 1997 CCAMLR had only just begun to adopt measures that dealt with the alarming rise in IUU fishing through the early to mid-1990s. By 2000 the IUU fishing and its associated impact on incidental mortality among seabirds does not appear to have been appreciably ameliorated, despite some limited and localised enforcement successes and the continued elaboration of conservation measures. So while CCAMLR is not in a state of decay it may be in a state of decline.

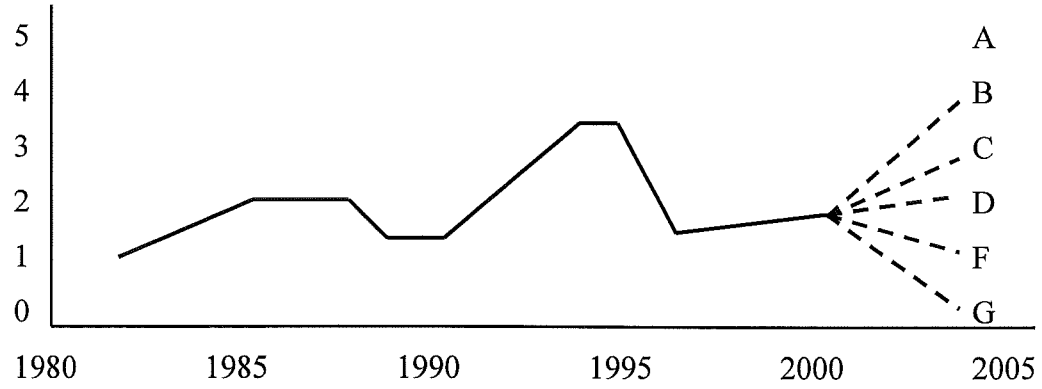
One way that these developments can be visualised and interpreted is by using Young's ordinal scale of success concept in an attempt to represent the effectiveness of the CCAMLR regime in a graph format. One axis represents the degree of effectiveness, the other the elapsed period of time. Following Young the effectiveness axis is rated from one through to five, representing varying degrees of effectiveness.[192] Presumably a rating of less than one would indicate the absence of a regime in that issue area. The scale of the time axis will depend on the regime being studied, in this example it is restricted to the time period that CCAMLR has been in existence. This graph is a simple tool for visualising the development of effectiveness in the CCAMLR regime and is not a comprehensive performance index. Young also suggests that the ATS would be regarded as very effective, but at the same time ranks most marine fishery regimes as being ineffective.[193] An ordinal scale might have some problems in reconciling the tension between ATS effectiveness and the potential ineffectiveness of its marine regime component in CCAMLR.

[191] Victoria Hallum, op. cit., p.65.

[192] Oran Young, op. cit., p.285 "a 1-5 scale of effectiveness might give a 5 to a regime that decisively solves the problem at stake, a 1 to a regime that is completely ineffectual, a 2 to a regime that is marginally effective, a 3 to a regime that produces substantial effects, and a 4 to a regime that is very effective without solving the problem altogether."

Graph 2

Effectiveness over Time for the CCAMLR regime



CCAMLR starts as an ineffective regime in 1982, lacking the ability to operate effectively due to a lack of knowledge about its issue area and the necessity of developing its decision-making procedures. Effectiveness initially rises in the 1980s as knowledge is accumulated and some initial decision-making problems are resolved, but hits a plateau when political problems prevent effective decision-making and the implementation of conservation measures. 1989-1991 is characterised as a period of decline and ineffectiveness while these problems are resolved, followed by a surge in effectiveness in the early 1990s during which CCAMLR attains its greatest level of perceived effectiveness. The problems of IUU fishing and incidental mortality come into view in the mid-1990s and the failure by CCAMLR to deal quickly with the problems leads to a decline in effectiveness that continues to the present day where CCAMLR is at best marginally effective, despite the adoption of new conservation measures to deal with the problems of IUU fishing and incidental mortality.

Using the graph a variety of future outcomes can be imagined to represent the potential effectiveness that CCAMLR may have. A continued decline in effectiveness could see CCAMLR reach position (F), where with a rating of one CCAMLR would be ineffectual and essentially a 'dead letter regime', while a 'regime collapse' is represented by position (G) where the effectiveness of CCAMLR drops below one. If CCAMLR deals effectively with the toothfish problems this might justify increase the effectiveness up to three at position (C). Establishing a framework that also deals with the imaginable potential

[193] ibid., p.272.

problems as well – such as extending VMS application to krill vessels – might justify a rating closer to four for effectiveness at position (B). If CCAMLR continues with a business as usual attitude, with no new conservation measures, this stagnation might be represented by position (D), but might justify a lower rating. One problem with this graph is that it does not do a good job of accounting for past failures, for example commercial extinction of the Patagonian toothfish is a cost that might take decades to recover from. If the problem had been dealt with quickly it might have justified a rating of four to five, but the time delay to date means that CCAMLR can only be given a rating of three or less for effectiveness.

Chapter 7

Conclusions

Early assessment

The Southern Ocean was the last major ocean to be explored and exploited. Whale, seal, and some finfish stocks were severely affected before the entry into force of the CCAMLR regime. When CCAMLR was established it was hoped that its ecosystem approach and precautionary principles would allow it to develop into an effective regime before the ecosystem could be further damaged by unregulated exploitation. CCAMLR had the potential to be effective – what was required was the political will to make it happen. One significant factor in CCAMLR's favour was that in the 1980s there were no stocks under heavy pressure from overfishing or IUU fishing. However, the 1980s saw a lost window of opportunity for the development of a framework of conservation measures. This happened because of the division in CCAMLR between conservation and fishing interests and the inability to gain a consensus that followed from this when unequivocal scientific advice was lacking. The conservation measures developed for protecting existing stocks and restoring depleted stocks were inadequate, and the status quo situation favoured fishing interests. There was a lack of commitment from the CCAMLR members to ensure enforcement and compliance with conservation measures in the Southern Ocean. A great deal of the attention of the Commission and the Scientific Committee was used up in resolving how scientific advice was to be generated and used by CCAMLR. Despite problems with data submission, CCAMLR did make some progress towards establishing the knowledge base required for effectiveness. CEMP was successfully developed, and a system of observation and inspection implemented. In the early 1990s, CCAMLR appeared to be in a good position, with the adoption of a range of new conservation measures and the establishment of the system of observation and inspection.

CCAMLR at the limits of rational use

At the end of the 1990s CCAMLR appears to have reached the limits of the traditional conception of the principle of rational use, because continued exploitation of the toothfish stocks would contribute to a definite reduction in the highest possible long term yield for

toothfish and potentially irreversible reductions in seabird populations. The framework of conservation measures established by CCAMLR did not prevent 'bad actors' from initiating IUU fishing in the Southern Ocean, as the risk of apprehension or punishment is low. With the environmental difficulties of the Southern Ocean, enforcement is not a sufficient solution by itself, as it can just lead to a displacement of IUU effort to different areas. The involvement of CCAMLR members in IUU fishing definitely undermines the authority of the CCAMLR regime and makes it vulnerable to external criticism.

CCAMLR has had difficulty in formulating innovative conservation measures to tackle the IUU problem, or in learning from the experience of other fisheries and conservation regimes. One factor in this is the lack of consensus in the Scientific Committee about solutions to the problem of IUU fishing, and the difficulty in setting TAC for toothfish has not helped. The other factor preventing innovative measures is the opposition of fishing interests in the Commission. Incidental mortality measures have had some success in the legitimate fishing industry, because a technical solution is possible and it matches up with the economic incentives of the fishing operations. However, until IUU fishing is controlled incidental mortality will continue to be a major problem for CCAMLR.

It is possible that the continued evolution of scientific models that strengthen the Scientific Committee's ability to predict the consequences of harvesting activities will eventually increase the strength of arguments made for adopting a precautionary approach. However, the objective of conservation in the Convention includes rational use, and this will always allow a state interested in pursuing fishing activities to make a strong argument for the continuation of fishing activities until it is conclusively proven that a stock has been over-exploited. This over-exploitation could be termed 'rationalised abuse' of the marine living resources. At the present time it would not appear to be rational to continue expanding the fishing effort in the entire Convention Area. However, it appears that sustainable fishing may be possible in some parts of the Southern Ocean which have been closely regulated and not badly affected by IUU fishing, such as the Ross Sea. This provides a loophole for continued fishing elsewhere in the Southern Ocean, for while some operators continue to fish it may be too much to expect forbearance from the fishing operators in other states who will want their slice of the toothfish market.

CCAMLR is in some respects held "hostage to its original assumptions".[1] Although CCAMLR can change some aspects of its rules and decision-making procedures there are limits imposed on the possible extent of change because of the principles and norms embedded in the Convention when it was negotiated. The area where this has the greatest impact is in relation to disputed sovereignty claims and EEZ jurisdiction in the Southern Ocean. The diplomatic hedging by the UK and Argentina in relation to the Falklands/Malvinas Islands dispute at Antarctic forums is a sterile ritual that is a continuing waste of valuable meeting time and political attention in the ATS. This is a reminder of the limits of the compromise on sovereignty embodied by Article IV of the Antarctic Treaty, and that while some actors may wish to imagine Antarctica as an internationalised territory, the claimant states are determined to maintain their claims.

CCAMLR is not yet capable of implementing the ecosystem approach and the precautionary principle. Despite this problem CCAMLR should remain the dominant forum for resolving the IUU fishing problem in the Southern Ocean, as it is unlikely that any other body could intervene more effectively than CCAMLR. The Patagonian toothfish may be preserved in some areas, but some stocks will reach commercial extinction. If the slow recovery of the stocks exploited before CCAMLR entered into force is any guideline, these toothfish stocks are unlikely to recover before 2020-2030. This means that CCAMLR has failed to attain one part of its conservation objectives. Despite this the Commission will almost certainly continue to authorise an expansion in fishing effort and after a hiatus of a decade of low effort interest in krill appears to be increasing. In light of the lack of success in managing the IUU fishing problems it is doubtful if CCAMLR is in a position to manage the level of krill catch that it has set a TAC for.

Assessment – the current effectiveness of CCAMLR

Without the problems of IUU fishing and associated incidental mortality a current assessment of CCAMLR would be favourable, although measures like CDS would probably not have been implemented without the pressure of IUU fishing. This would have left CCAMLR in a position to be affected by a similar shock or crisis in the future. Responses by CCAMLR to this problem could have been faster, but this was unlikely in

[1] Alan Hemmings interview, 22 November 2000.

the face of fishing interests slowing the development of conservation measures, and the time that it takes to develop public awareness of the issue and domestic pressure on governments to deal with the problem. The parameters of the IUU fishing problems do not appear to have changed significantly since they first became an issue. IUU fishing remains a challenge to the credibility of CCAMLR and the ATS. The by-catch of seabirds in IUU fishing remains unacceptably high. Knowledge of the stocks being targeted and the effects on dependent species remains poor. The much vaunted CDS complicates the information gathering of the Scientific Committee without fully addressing the market-end incentives that drive the IUU fishing.

The toothfish shock highlights the ineffectiveness of CCAMLR, but it may contribute to increased regime effectiveness in the future. This will be important if exploitation of krill increases, or if previously exploited finfish stocks recover to a harvestable level and attract renewed interest. However, this does not justify the ineffectiveness of the regime in dealing with the current impact of the toothfish shock. It appears that a sustained shock is less likely to destabilise the regime, but that developing effective measures takes longer. If the toothfish problem had been perceived more as a crisis, then while it may have been more likely to destabilise the regime, it could have seen conservation measures developed over a shorter period of time. CCAMLR and the ATS regimes have remained stable – despite warnings of the urgency of the IUU fishing problems and their potential to undermine the CCAMLR regime. This stability comes at the price of a reduction in the resilience of the regime through its lack of innovation, which illustrates how CCAMLR has the potential to become brittle under stress.

The toothfish shock has affected some areas of effectiveness in CCAMLR, but not all of them. While there has been some enhancement of transparency and capacity, other fundamental characteristics of the regime and its issue area remain unchanged. For transparency the role of the environmental NGOs is crucial in keeping the CCAMLR members honest. The paradox is that increased enforcement and conservation efforts have made it harder to track the full extent of IUU fishing, and without that data it may be harder for arguments in favour of further conservation measures to gain acceptance. The capacity devoted by some members to the problem has increased, but this has not by itself solved the IUU fishing problem. A membership influx of developing states with minimal capacity may superficially improve the effectiveness of the regime, but may burden the

Secretariat and other members with new financial costs as they attempt to raise these states up to the standard desired by CCAMLR. The greatest physical power to solve the problem is possessed by those states that act as gateways and transshipping points for the trade in toothfish.

Regime theory has been of mixed use in analysing CCAMLR's response to IUU fishing. The contestable nature of the concepts of regime theory and the vagueness in terminology increase the difficulty of applying regime theory to the case study in a precise manner. This has been the case with the attempt to apply the determinants of effectiveness, rather than consolidating or refining regime theory, the result is more a vigorous stirring up of the mud in a silted up riverbed. A different framework with fewer individual factors might be a more profitable approach in future for analysing regime effectiveness. The hard case concept is useful, in that it demonstrates that CCAMLR has made a difference because it has shaped the behaviour of the actors involved in the regime, even if it has not yet successfully increased the level of compliance among the commercial operators involved in IUU fishing. The natural experiments and counter-factual arguments presented in Chapter 6 represent to some extent a 'common sense' approach to investigating the case study. These are useful in analysing conservation measures and the development of the CAMLR regime, but do little to advance regime theory as a field of study.

Epistemic communities and regime effectiveness

Identifying an epistemic community is a difficult task, it does not wave flags, or issue membership cards. Although Haas stresses the role of individuals in an epistemic community, in CCAMLR it is easier to find out a state or NGO position on an issue than that of an individual because of the way CCAMLR meetings are recorded. Identifying a community is a task that overlaps with that of determining its principles, norms, and causal beliefs. Three epistemic community like groupings can be tentatively identified and their activities traced in CCAMLR: the environmental community, the conservation community, and the fishing community. The point of difference between the environmental community and the conservation community is in the conservation communities' adherence to ATS norms and principles, while the difference between the conservation and fishing communities is in their interpretation of the precautionary principle.

The concept of the 'domain' or 'issue area' of an epistemic community is fuzzy. Is an epistemic community a group that pushes forward one concept, or several concepts? Is an epistemic community an active and continuing force in a particular issue area, with concepts that evolve over time, or does the community expire with the success or failure of its ideas in the policy arena? If an epistemic community does persist over time in a regime then it should begin to act like an established interest group. Informal associations already exist within the ATS regime, such as those based around a common language, geographical position, or common heritage. The existence of competing epistemic communities appears to be a feature of CCAMLR, but this is possibly not a negative feature if the friction between different communities can lead to creative tension that eventually enhances regime effectiveness.

Tracing the activities of an epistemic community is difficult when a clear distinction between individuals and states or other actors can not be drawn. Litfin's concept of a 'knowledge-broker' is useful, but is also difficult to operationalise within the CCAMLR regime. Tracing activities also overlaps with demonstrating an epistemic communities influence, or lack thereof. The conservation community has been effective making it known that the problem of IUU fishing exists, and the environmental community has also highlighted the role played by CCAMLR member state nationals and companies. The fishing community has had some success at impeding the imposition of higher standards of environmental protection, especially attempts at imposing flag state measures on nationals and the moratorium idea. VMS, CDS and TAC issues have seen more mixed degrees of success for the different epistemic communities. The TAC system has stayed largely as it is, a short term success for the fishing community as fisheries continue to expand. However, if this success leads to abuse of the resources, then it becomes clear that epistemic communities do not necessarily lead to a more effective regime, and could in fact lead to a less effective regime. VMS has begun to be introduced following adoption at the national level in many member states and a growing international acceptance in other fisheries. The introduction of CDS is perhaps the signal achievement of the conservation community. Although the CDS was reduced in scope below what was desired by the environmentalists, efforts by environmental community members acting outside CCAMLR helped lead to the political pressure to adopt the CDS.

Several factors are important in determining whether or not a policy can be adopted by CCAMLR. Firstly it has to be capable of occurring within the decision-making procedures of CCAMLR. For the fishing community to defend the status quo requires a blocking coalition of only a few member states, while for a conservation community policy to be adopted a degree of near unanimity needs to be obtained. Secondly, when the situation is treated as ordinary, or only a mild shock, then for a new idea to succeed it must not be too radical a departure from existing ideas. In a crisis situation new ideas are more likely to be adopted. Thirdly, the politics of CCAMLR is framed by science, and this is where the fishing community gain some of their bargaining power, because the information provided from their fishing activities is essential to the production of CCAMLR science.

Arguments have been made that the scientific community will have to be more political in its advocacy of policy if it wants to play a more effective role in Antarctic affairs.[2] The problem with this is that in desiring for science to more actively drive politics, there is the risk of undermining the credibility of the science in CCAMLR through that political association. If the CCAMLR members are still divided on the basis of their political and economic interests, then what a scientific community can achieve in respect of the environment is severely limited by those interests, even when the states are aware that it is in their own self-interest to preserve and study the living marine resources of the Southern Ocean. Bargaining in CCAMLR is still framed by a consensus among the members about the freeze in the territorial sovereignty issue. A major issue for the future effectiveness of CCAMLR will be the impact of the development of accurate ecosystem models over the next decade and the effect that will have on political debates relying on conservation with rational use.

The concept of epistemic communities is a superficially seductive one, on the surface it appears to explain why ideas can have the influence they do in making regimes more or less effective. However, operationalising the concept of epistemic communities proved to be difficult with CCAMLR and the identification of the three epistemic communities is less than satisfactory. The different communities are too easily conflated with interest

[2] Bruce Davis, "Science and Politics in Antarctic and Southern Oceans Policy: A Critical Assessment", in R.A. Hall, H.R. Hall, and M.G. Haward, *Antarctica's Future: Continuity or Change?*, Tasmanian Government Printer: Hobart, 1990, p.44. Become political in two ways persuade "governments and communities alike that scientific research in Antarctica produces both basic long term benefits and immediate

groups for the influence of ideas to be demonstrated over that of more traditional bargaining processes. To have a greater confidence in that finding would require the operating of CCAMLR to be so transparent that few if any diplomatic secrets could be preserved from public scrutiny, an unlikely development in international relations.

Future policy suggestions

No single conservation measure by itself is likely to solve the problems of IUU fishing, but each can contribute to a growing framework of measures that should increase the effectiveness of the CCAMLR regime. In the future it is to be hoped that the states with an interest in the krill fishery can be persuaded to accept VMS for krill vessels before the krill fishery expands significantly beyond current fishing efforts. The CDS can be improved and some of the resolutions adopted in 2000 may form the basis for future conservation measures. The CDS will also require cooperation with non-members to work. This will involve an expansion of diplomatic effort by the CCAMLR Secretariat and other interested member states. Flag state measures have some of the greatest untapped potential, but also face strong opposition from some members. Globally there does appear to be some movement towards moderating the worst excesses of the problems caused by flags of convenience and flag state irresponsibility. Bearing this in mind legal innovation remains a promising approach for the development of new conservation measures.

Another area where the Secretariat could play a greater role is in the collection and distribution of information related to the IUU fishing problems. A degree of centralisation in the Secretariat could avoid duplication of effort among the members. With the lack of information caused by displacement of IUU fishing activities and evasion on the part of the IUU fishing operators, the Commission can not afford to be fussy about the sources of its intelligence. Better use could be made of information from environmental NGOs like ISOFISH and Greenpeace. Demanding the highest possible levels of certainty for information can delay decision-making to the point where the decision is made too late. More creative use could be made of legal fishing, research, and tourism vessels to report directly to the CCAMLR Secretariat. As relates to regime transparency it would be better if the catch reports of different EU members were not aggregated together.

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relevant knowledge of value and society ... taking a proactive and educational role in environmental conservation of the continent."

In dealing with the problem of uncertainty, CCAMLR will need to evaluate what methods provide for sustainable harvesting in accordance with the long term conservation objectives of the convention.[3] The best time to carry out testing is before you expand the fisheries, because as the Scientists working with CCAMLR understand: the "CCAMLR experience has demonstrated that obtaining consensus to make difficult adjustments only after the need for them has become apparent is a major problem".[4] In this respect "conservation objectives can only be achieved by implementing management measures even when very little is known."[5] But CCAMLR may yet prove adequate. As Sahurie phrased it: "At stake is more than the allocation of living resources; indeed, the whole credibility of the Treaty System for both the parties and the outsiders may be affected if CCAMLR becomes a corrosive matter."[6] A zero catch limit on commercial fishing that allows research to establish stock size with some degree of confidence is well within the concept of a precautionary approach to preserving the ecosystem of the Southern Ocean. The concept of a moratorium is not really that radical, the main problem with the idea is that it lies in opposition to the short term profits that can be made by commercial operators in the Southern Ocean.

Effectiveness can be difficult to apply meaningfully to the CCAMLR regime, as actors may pursue solutions to problems through other means in addition to the regime, so that a seemingly effective regime may in fact be a sideshow. Some of the range of possible unilateral actions are unlikely to be attempted due to the sovereignty problem. The CCAMLR members with Antarctic claims could consider enforcing EEZ off the coast of Antarctica, but apart from the conflict this would generate with non-claimants, the resulting EEZ would not cover all of the Southern Ocean. This suggests that solutions to problems in the ATS regime have to be multilateral, and may have to involve third-party states who may not be willing to accede to the Convention. There is the possibility of complementary action through other associated regimes, such as the IWC and other fisheries regimes to the north of the Convention Area. The global dimension of the marine fisheries problems mean that the CCAMLR regime by itself is not enough to solve the problems of the Southern Ocean. Problems with straddling stocks and migratory species

[3] SC-CAMLR-XVIII/BG/26, p.29.
[4] SC-CAMLR-XVIII/BG/26, p.31.
[5] ibid.
[6] Emilio J. Sahurie, op. cit., p.537.

are being addressed with new international agreements that CCAMLR members will have to work with.

Future areas for research

The problems of IUU fishing in the Southern Ocean have not yet been effectively resolved. The IUU problem is also not restricted to the Southern Ocean, and efforts are under way to tackle the problem with a more global approach. So there is room for continued research on this problem in the Southern Ocean and at the global level. It will be interesting to see how links between global initiatives, such as those organised through the FAO, are integrated with regional fisheries organisations like CCAMLR, and other regional multilateral initiatives. With CCAMLR it will be interesting to see how any expansion in the krill fishery is handled, whether the conservation measures will be adequate to ensure conservation of the resource, or a repeat of the IUU fishing of the Patagonian toothfish.

More thought about an ordinal scale of effectiveness for regimes would be a useful addition to existing theory. Care needs to be taken when attempting to apply a scale to a regime like the ATS regime, because of the potential for differing levels of effectiveness among the different sub-regimes of the ATS regime. Oran Young is correct to categorise theory relating to effectiveness as being in the middle of its development. There is still some way to go before a conceptually clear theory of effectiveness can be deployed to assess how effective a regime is.

At the moment the estimates are that the Scientific Committee will develop useful ecosystem models for the Southern Ocean in the next five to ten years. It will be interesting to see what affect this development has on the politics of the CCAMLR regime and whether or not greater confidence in the limits of rational use strengthens the bargaining ability of the conservation and environmental communities at the expense of the fishing community. One possibility is that the dissent between the different communities may vanish, but its also possible that fishing interests will simply formulate new arguments to protect their commercial interests and this would demonstrate the weakness that ideas and information alone can have on regime effectiveness.

Sovereignty remains an area about which much is said but little can be done. Change in this area appears unlikely to come from within the ATS, because the central principles and norms underpinning the ATS regime are unlikely to be removed. The ATS regime is to some extent frozen in 1959 in the manner in which it treats sovereignty, which also applies to CCAMLR due to its links between the Convention and the Antarctic Treaty. While this may make the ATS regime stable, it does not always contribute to regime effectiveness. It will be interesting to see how the development of wider trends in sovereignty dealing with the use of common spaces, such as the high seas, and how they might be applied to Antarctica and the Southern Ocean. While the development of sovereignty has become more complex since 1959, or even 1982, with more attention being paid to distinctions like flag state, port state, and coastal state, legal innovation could be a source of solutions to problems as well as a cause of friction.

Regime change has occurred in CCAMLR in response to the problems of IUU fishing and incidental mortality. Of the four models of regime change the models that concentrate on politico-military resources are of the least use in explaining change in the CCAMLR regime – probably because of the limited use of such power resources in a demilitarised Antarctica and on the high seas of the Southern Ocean. The economic process model is good at illustrating the initial causes that drive regime change, but the issue structure and international organisation models are better at explaining the exact process by which regime change occurs.

Part of the attraction in the case study was the potential for a decline in the effectiveness of CCAMLR, possibly even a collapse of the regime if fishing interests moved to completely block progress towards more effective conservation measures. A decline in the effectiveness of CCAMLR is also interesting for the implications it has for the wider ATS regime. So far the indications are that while CCAMLR has reached a less than optimal level of effectiveness it is in no real danger of collapse. Its membership continues to grow, external criticism from non-member states has been muted, and some progress is being made towards the conservation objectives. As Joyner observed, the ATS is prone to going through periods of creative tension, and what may appear as an ineffective regime at one point in time has often within a few years regained a high level of effectiveness. Regime decay is an interesting area requiring further exploration, but case studies like CCAMLR are not as useful as those involving regimes which have failed. In this respect it might be

worthwhile to investigate the failure of the CRAMRA regime with respect to regime theory, although there is probably not as much to be learned from a non-regime case study as there is from a regime that was successfully created and collapsed while in operation.

Final summation

The 'white gold' of toothfish in the Southern Ocean has caused a significant expansion in uncontrolled fishing and an alarming rate of incidental mortality among many of the sea bird species of the Southern Ocean. Despite CCAMLR's ecosystem approach and precautionary principles control over the fishing effort has not been regained. This is not necessarily due to the approach and principles being flawed in and of themselves, but more due to a lack of scientific knowledge to generate the data and conclusions that would lead to the political impetus required to respond decisively to the threat posed by IUU fishing. In 2000 John Croxall observed that: "Having spent the best part of 25 years working with albatrosses and seeing the prospects of these wonderful birds decline, I find it ironic that many populations may be saved from extinction only because fish caught by long-liners will become commercially extinct."[7] That the commercial extinction of toothfish may prevent further depletion of seabird numbers is an example of the "toothless fishing" of the CCAMLR regime.[8]

If the ATS and CCAMLR regimes had accumulated a bank of authority and credibility for their management of the Southern Ocean, then the shock of the IUU fishing problems has left a black mark on that record. From the earliest time that CCAMLR has been struggling to deal with this problem comments have been made that the issue is a challenge to the credibility of the CCAMLR and ATS regimes. In 1997 Stuart Prior observed that CCAMLR worked well when no one fished in the Convention Area: "But now it [CCAMLR] may prove to be a Maginot line, outflanked by flags of convenience."[9] A fisheries regime that is only effective when there is no significant harvesting is not an effective fisheries regime. The effectiveness of the ATS in turn depends in part on the effectiveness of its component regimes, so if CCAMLR is ineffective then the ATS is also ineffective. It has become obvious that the concerns of the developing world and the

[7] http://www.naturezoneuk.co.uk/birdzone/SAVINGTHEALBATROSS/ (site visited January 20, 2001).
[8] I owe the phrase to Gary Steele.
[9] "Toothfish Plunder Threatens Southern Oceans", *Antarctic: The Journal of the New Zealand Antarctic Society*, 15 (2), 1997, p.30.

environmental NGOs as to the ability of the ATCPs to manage Antarctica in the best interests of the world were not entirely misplaced. Individuals and companies from within the club of developed nations in CCAMLR have exploited the living marine resources of the Southern Ocean, making a substantial profit, and leaving an environmental disaster that may take decades to reverse – if some of the affected species can ever be restored to their former population levels. Strong external criticism of CCAMLR, outside of the environmental NGOs, is yet to be launched on the basis of this problem, but if the Madrid Protocol was not in place the external CHM advocates would have gained a substantial weakness in the ATS that could be exploited. Unfortunately, this is not an isolated incident, but one of many such cases that have happened as the limits of the marine living resources of the world's oceans have been reached. Hopefully the 'spirit of cooperation' that the ATS is known for will prove capable of overcoming the problems of the last ocean.

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APPENDIX I: The Antarctic Treaty

Done at Washington, 1 December 1959; entered into force 23 June, 1961.

The Antarctic Treaty

The Governments of Argentina, Australia, Belgium, Chile, the French Republic, Japan, New Zealand, Norway, the Union of South Africa, the Union of Soviet Socialist Republics, the United Kingdom of Great Britain and Northern Ireland, and the United States of America,

Recognizing that it is in the interest of all mankind that Antarctica shall continue for ever to be used exclusively for peaceful purposes and shall not become the scene or object of international discord;

Acknowledging the substantial contributions to scientific knowledge resulting from international cooperation in scientific investigation in Antarctica;

Convinced that the establishment of a firm foundation for the continuation and development of such cooperation on the basis of freedom of scientific investigation in Antarctica as applied during the International Geophysical Year accords with the interests of science and the progress of all mankind;

Convinced also that a treaty ensuring the use of Antarctica for peaceful purposes only and the continuance of international harmony in Antarctica will further the purposes and principles embodied in the Charter of the United Nations;

Have agreed as follows:

Article I

1. Antarctica shall be used for peaceful purposes only. There shall be prohibited, inter alia, any measure of a military nature, such as the establishment of military bases and fortifications, the carrying out of military manoeuvres, as well as the testing of any type of weapon.

2. The present Treaty shall not prevent the use of military personnel or equipment for scientific research or for any other peaceful purpose.

Article II

Freedom of scientific investigation in Antarctica and cooperation toward that end, as applied during the International Geophysical Year, shall continue, subject to the provisions of the present Treaty.

Article III

1. In order to promote international cooperation in scientific investigation in Antarctica, as provided for in Article II of the present Treaty, the Contracting Parties agree that, to the greatest extent feasible and practicable:

(a) Information regarding plans for scientific programs in Antarctica shall be exchanged to permit maximum economy of and efficiency of operations;

(b) Scientific personnel shall be exchanged in Antarctica between expeditions and stations;

(c) Scientific observations and results from Antarctica shall be exchanged and made freely available.

Article IV

1. Nothing contained in the present Treaty shall be interpreted as:

(a) A renunciation by any Contracting Party of previously asserted rights of or claims to territorial sovereignty in Antarctica;

(b) A renunciation or diminution by any Contracting Party of any basis of claim to territorial sovereignty in Antarctica which it may have whether as a result of its activities or those of its nationals in Antarctica, or otherwise;

(c) Prejudicing the position of any Contracting Party as regards its recognition or non-recognition of any other State's rights of or claim or basis of claim to territorial sovereignty in Antarctica.

2. No acts or activities taking place while the present Treaty is in force shall constitute a basis for asserting, supporting or denying a claim to territorial sovereignty in Antarctica or create any rights of sovereignty in Antarctica. No new claim, or enlargement of an existing claim, to territorial sovereignty in Antarctica shall be asserted while the present Treaty is in force.

Article V

1. Any nuclear explosions in Antarctica and the disposal there of radioactive waste material shall be prohibited.

2. In the event of the conclusion of international agreements concerning the use of nuclear energy, including nuclear explosions and the disposal of radioactive waste material, to which all of the Contracting Parties whose representatives are entitled to participate in the meetings provided for under Article IX are parties, the rules established under such agreements shall apply in Antarctica.

Article VI

The provisions of the present Treaty shall apply to the area south of 60° South Latitude, including all ice shelves, but nothing in the present Treaty shall prejudice or in any way affect the rights, or the exercise of the rights, of any State under international law with regard to the high seas within that area.

Article VII

1. In order to promote the objectives and ensure the observance of the provisions of the present Treaty, each Contracting Party whose representatives are entitled to participate in the meetings referred to in Article IX of the Treaty shall have the right to designate observers to carry out any inspection provided for by the present Article. Observers shall be nationals of the Contracting Parties which designate them. The names of observers shall be communicated to every other Contracting Party having the right to designate observers, and like notice shall be given of the termination of their appointment.

2. Each observer designated in accordance with the provisions of paragraph 1 of this Article shall have complete freedom of access at any time to any or all areas of Antarctica.

3. All areas of Antarctica, including all stations, installations and equipment within those areas, and all ships and aircraft at points of discharging or embarking cargoes or personnel in Antarctica, shall be open at all times to inspection by any observers designated in accordance with paragraph 1 of this Article.

4. Aerial observation may be carried out at any time over any or all areas of Antarctica by any of the Contracting Parties having the right to designate observers.

5. Each Contracting Party shall, at the time when the present Treaty enters into force for it, inform the other Contracting Parties, and thereafter shall give them notice in advance, of

(a) All expeditions to and within Antarctica, on the part of its ships or nationals, and all expeditions to Antarctica organized in or proceeding from its territory;

(b) All stations in Antarctica occupied by its nationals; and

(c) Any military personnel or equipment intended to be introduced by it into Antarctica subject to the conditions prescribed in paragraph 2 of Article I of the present Treaty.

Article VIII

1. In order to facilitate the exercise of their functions under the present Treaty, and without prejudice to the respective positions of the Contracting Parties relating to jurisdiction over all other persons in Antarctica, observers designated under paragraph 1 of Article VII and scientific personnel exchanged under sub-paragraph 1(b) of Article III of the Treaty, and members of the staffs accompanying any such persons, shall be subject only to the jurisdiction of the Contracting Party of which they are nationals in respect of all acts or omissions occurring while they are in Antarctica for the purpose of exercising their functions.

2. Without prejudice to the provisions of paragraph 1 of this Article, and pending the adoption of measures in pursuance of subparagraph 1(e) of Article IX, the Contracting Parties concerned in any case of dispute with regard to the exercise of jurisdiction in Antarctica shall immediately consult together with a view to reaching a mutually acceptable solution.

Article IX

1. Representatives of the Contracting Parties named in the preamble to the present Treaty shall meet at the City of Canberra within two months after the date of entry into force of the Treaty, and thereafter at suitable intervals and places, for the purpose of exchanging information, consulting together on matters of common interest pertaining to Antarctica, and formulating and considering, and recommending to their Governments, measures in furtherance of the principles and objectives of the Treaty, including measures regarding:

(a) Use of Antarctica for peaceful purposes only;

(b) Facilitation of scientific research in Antarctica;

(c) Facilitation of international scientific cooperation in Antarctica;

(d) Facilitation of the exercise of the rights of inspection provided for in Article VII of the Treaty;

(e) Questions relating to the exercise of jurisdiction in Antarctica;

(f) preservation and conservation of living resources in Antarctica.

2. Each Contracting Party which has become a party to the present Treaty by accession under Article XIII shall be entitled to appoint representatives to participate in the meetings referred to in paragraph 1 of the present Article, during such times as that Contracting Party demonstrates its interest in Antarctica by conducting substantial research activity there, such as the establishment of a scientific station or the dispatch of a scientific expedition.

3. Reports from the observers referred to in Article VII of the present Treaty shall be transmitted to the representatives of the Contracting Parties participating in the meetings referred to in paragraph 1 of the present Article.

4. The measures referred to in paragraph 1 of this Article shall become effective when approved by all the Contracting Parties whose representatives were entitled to participate in the meetings held to consider those measures.

5. Any or all of the rights established in the present Treaty may be exercised as from the date of entry into force of the Treaty whether or not any measures facilitating the exercise of such rights have been proposed, considered or approved as provided in this Article.

Article X

Each of the Contracting Parties undertakes to exert appropriate efforts, consistent with the Charter of the United Nations, to the end that no one engages in any activity in Antarctica contrary to the principles or purposes of the present Treaty.

Article XI

1. If any dispute arises between two or more of the Contracting Parties concerning the interpretation or application of the present Treaty, those Contracting Parties shall consult among themselves with a view to having the dispute resolved by negotiation, inquiry, mediation, conciliation, arbitration, judicial settlement or other peaceful means of their own choice.

2. Any dispute of this character not so resolved shall, with the consent, in each case, of all parties to the dispute, be referred to the International Court of Justice for settlement; but failure to reach agreement on reference to the International Court shall not absolve parties to the dispute from the responsibility of continuing to seek to resolve it by any of the various peaceful means referred to in paragraph 1 of this Article.

Article XII

1. (a) The present Treaty may be modified or amended at any time by unanimous agreement of the Contracting Parties whose representatives are entitled to participate in the meetings provided for under Article IX. Any such modification or amendment shall enter into force when the depositary Government has received notice from all such Contracting Parties that they have ratified it.

(b) Such modification or amendment shall thereafter enter into force as to any other Contracting Party when notice of ratification by it has been received by the depositary Government. Any such Contracting Party from which no notice of ratification is received within a period of two years from the date of entry into force of the modification or amendment in accordance with the provision of subparagraph 1(a) of this Article shall be deemed to have withdrawn from the present Treaty on the date of the expiration of such period.

2. (a) If after the expiration of thirty years from the date of entry into force of the present Treaty, any of the Contracting Parties whose representatives are entitled to participate in the meetings provided for under Article IX so requests by a communication addressed to the depositary Government, a Conference of all the Contracting Parties shall be held as soon as practicable to review the operation of the Treaty.

(b) Any modification or amendment to the present Treaty which is approved at such a Conference by a majority of the Contracting Parties there represented, including a majority of those whose representatives are entitled to participate in the meetings provided for under Article IX, shall be

communicated by the depositary Government to all Contracting Parties immediately after the termination of the Conference and shall enter into force in accordance with the provisions of paragraph 1 of the present Article.

(c) If any such modification or amendment has not entered into force in accordance with the provisions of subparagraph 1(a) of this Article within a period of two years after the date of its communication to all the Contracting Parties, any Contracting Party may at any time after the expiration of that period give notice to the depositary Government of its withdrawal from the present Treaty; and such withdrawal shall take effect two years after the receipt of the notice by the depositary Government.

Article XIII

1. The present Treaty shall be subject to ratification by the signatory States. It shall be open for accession by any State which is a Member of the United Nations, or by any other State which may be invited to accede to the Treaty with the consent of all the Contracting Parties whose representatives are entitled to participate in the meetings provided for under Article IX of the Treaty.

2. Ratification of or accession to the present Treaty shall be effected by each State in accordance with its constitutional processes.

3. Instruments of ratification and instruments of accession shall be deposited with the Government of the United States of America, hereby designated as the depositary Government.

4. The depositary Government shall inform all signatory and acceding States of the date of each deposit of an instrument of ratification or accession, and the date of entry into force of the Treaty and of any modification or amendment thereto.

5. Upon the deposit of instruments of ratification by all the signatory States, the present Treaty shall enter into force for those States and for States which have deposited instruments of accession. Thereafter the Treaty shall enter into force for any acceding State upon the deposit of its instruments of accession.

6. The present Treaty shall be registered by the depositary Government pursuant to Article 102 of the Charter of the United Nations.

Article XIV

The present Treaty, done in the English, French, Russian and Spanish languages, each version being equally authentic, shall be deposited in the archives of the Government of the United States of America, which shall transmit duly certified copies thereof to the Governments of the signatory and acceding States.

APPENDIX II: Convention on the Conservation of Antarctic Marine and Living Resources

Done at Canberra, 20 May, 1980; entered into force 7 April, 1981.

Text of statement included in the Final Act of the Conference.

"1. Measures for the conservation of Antarctic marine living resources of the waters adjacent to Kerguelen and Crozet, over which France has jurisdiction adopted by France prior to the entry into force of the Convention, would remain in force after the entry into force of the Convention until modified by France acting within the framework of the Commission or otherwise.
2. After the Convention has come into force, each time the Commission should undertake examination of the conservation needs of the marine living resources of the general area in which the waters adjacent to Kerguelen and Crozet are to be found, it would be open to France either to agree that the waters in question should be included in the area of application of any specific conservation measure under consideration or to indicate that they should be excluded. In the latter event, the Commission would not proceed to the adoption of the specific conservation measure in a form applicable to the waters in question unless France removed its objection to it. France could also adopt such national measures as it might deem appropriate for the waters in question.
3. Accordingly, when specific conservation measures are considered within the framework of the Commission and with the participation of France, then:
(a) France would be bound by any conservation measures adopted by consensus with its participation for the duration of the measures. This would not prevent France from promulgating national measures that were more strict than the Commission's measures or which dealt with other matters; (b) In the absence of consensus, France could promulgate any national measures which it might deem appropriate.
4. Conservation measures, whether national measures or measures adopted by the Commission, in respect of the waters adjacent to Kerguelen and Crozet, would be enforced by France. The system of observation and inspection foreseen by the Convention would not be implemented in the waters adjacent to Kerguelen and Crozet except as agreed by France and in the matter so agreed.
5. The understandings, set forth in paragraphs 1-4 above, regarding the application of the Convention to waters adjacent to the Islands of Kerguelen and Crozet, also apply to waters adjacent to the islands within the area to which this Convention applies over which the existence of State sovereignty is recognized by all Contracting Parties."

Convention on the Conservation of Antarctic Marine living Resources

The Contracting Parties,

RECOGNIZING the importance of safeguarding the environment and protecting the integrity of the ecosystem of the seas surrounding Antarctica;

NOTING the concentration of marine living resources found in Antarctic waters and the increased interest in the possibilities offered by the utilization of these resources as a source of protein;

CONSCIOUS of the urgency of ensuring the conservation of Antarctic marine living resources;

CONSIDERING that it is essential to increase knowledge of the Antarctic marine ecosystem and its components so as to be able to base decisions on harvesting on sound scientific information;

BELIEVING that the conservation of Antarctic marine living resources calls for international co-operation with due regard for the provisions of the Antarctic Treaty and with the active involvement of all States engaged in research or harvesting activities in Antarctic waters;

RECOGNIZING the prime responsibilities of the Antarctic Treaty Consultative Parties for the protection and preservation of the Antarctic environment and, in particular, their responsibilities

under Article IX, paragraph 1(f) of the Antarctic Treaty in respect of the preservation and conservation of living resources in Antarctica;

RECALLING the action already taken by the Antarctic Treaty Consultative Parties including in particular the Agreed Measures for the Conservation of Antarctic Fauna and Flora, as well as the provisions of the Convention for the Conservation of Antarctic Seals;

BEARING in mind the concern regarding the conservation of Antarctic marine living resources expressed by the Consultative Parties at the Ninth Consultative Meeting of the Antarctic Treaty and the importance of the provisions of Recommendation IX-2 which led to the establishment of the present Convention;

BELIEVING that it is in the interest of all mankind to preserve the waters surrounding the Antarctic continent for peaceful purposes only and to prevent their becoming the scene or object of international discord;

RECOGNIZING in the light of the foregoing, that it is desirable to establish suitable machinery for recommending, promoting, deciding upon and coordinating the measures and scientific studies needed to ensure the conservation of Antarctic marine living organisms;

HAVE AGREED as follows:

Article I

1. This Convention applies to the Antarctic marine living resources of the area south of 60° South latitude and to the Antarctic marine living resources of the area between that latitude and the Antarctic Convergence which form part of the Antarctic marine ecosystem.
2. Antarctic marine living resources means the populations of fin fish, molluscs, crustaceans and all other species of living organisms, including birds, found south of the Antarctic Convergence.
3. The Antarctic marine ecosystem means the complex of relationships of Antarctic marine living resources with each other and with their physical environment.
4. The Antarctic Convergence shall be deemed to be a line joining the following points along parallels of latitude and meridians of longitude:
50°S 0°; 50°S, 30°E; 45°S, 30°E; 45°S, 80°E; 55°S, 80°E; 55°S, 150°E; 60°S, 150°E; 60°S, 50°W; 50°S, 50°W; 50°S, 0°.

Article II

1. The objective of this Convention is the conservation of Antarctic marine living resources.
2. For the purpose of this Convention, the term 'conservation' includes rational use.
3. Any harvesting and associated activities in the area to which this Convention applies shall be conducted in accordance with the provisions of this Convention and with the following principles of conservation:
(a) Prevention of decrease in the size of any harvested population to levels below those which ensure its stable recruitment. For this purpose its size should not be allowed to fall below a level close to that which ensures the greatest net annual increment;
(b) maintenance of the ecological relationships between harvested, dependent and related populations of Antarctic marine living resources and the restoration of depleted populations to the levels defined in sub-paragraph (a) above; and
(c) prevention of changes or minimization of the risk of changes in the marine ecosystem which are not potentially reversible over two or three decades, taking into account the state of available knowledge of the direct and indirect impact of harvesting, the effect of the introduction of alien species, the effects of associated activities on the marine ecosystem and of the effects of environmental changes, with the aim of making possible the sustained conservation of Antarctic marine living resources.

Article III

The Contracting Parties, whether or not they are Parties to the Antarctic Treaty, agree that they will not engage in any activities in the Antarctic Treaty area contrary to the principles and purposes of that Treaty and that, in their relations with each other, they are bound by the obligations contained in Articles I and V of the Antarctic Treaty.

Article IV

1. With respect to the Antarctic Treaty area, all Contracting Parties, whether or not they are Parties to the Antarctic Treaty, are bound by Articles IV and VI of the Antarctic Treaty in their relations with each other.
2. Nothing in this Convention and no acts or activities taking place while the present Convention is in force shall:
(a) constitute a basis for asserting, supporting or denying a claim to territorial sovereignty in the Antarctic Treaty area or create any rights of sovereignty in the Antarctic Treaty area;
(b) be interpreted as a renunciation or diminution by any Contracting Party of, or as prejudicing, any right or claim or basis of claim to exercise coastal state jurisdiction under international law within the area to which this Convention applies;
(c) be interpreted as prejudicing the position of any Contracting Party as regards its recognition or non-recognition of any such right, claim or basis of claim;
(d) affect the provision of Article IV, paragraph 2, of the Antarctic Treaty that no new claim, or enlargement of an existing claim, to territorial sovereignty in Antarctica shall be asserted while the Antarctic Treaty is in force.

Article V

1. The Contracting Parties which are not Parties to the Antarctic Treaty acknowledge the special obligations and responsibilities of the Antarctic Treaty Consultative Parties for the protection and preservation of the environment of the Antarctic Treaty area.
2. The Contracting Parties which are not Parties to the Antarctic Treaty agree that, in their activities in the Antarctic Treaty area, they will observe as and when appropriate the Agreed Measures for the Conservation of Antarctic Fauna and Flora and such other measures as have been recommended by the Antarctic Treaty Consultative Parties in fulfilment of their responsibility for the protection of the Antarctic environment from all forms of harmful human interference.
3. For the purposes of this Convention, `Antarctic Treaty Consultative Parties' means the Contracting Parties to the Antarctic Treaty whose Representatives participate in meetings under Article IX of the Antarctic Treaty.

Article VI

Nothing in this Convention shall derogate from the rights and obligations of Contracting Parties under the International Convention for the Regulation of Whaling and the Convention for the Conservation of Antarctic Seals.

Article VII

1. The Contracting Parties hereby establish and agree to maintain the Commission for the Conservation of Antarctic Marine Living Resources (hereinafter referred to as `the Commission').
2. Membership in the Commission shall be as follows:
(a) each Contracting Party which participated in the meeting at which this Convention was adopted shall be a Member of the Commission;
(b) each State Party which has acceded to this Convention pursuant to Article XXIX shall be entitled to be a Member of the Commission during such time as that acceding party is engaged in

research or harvesting activities in relation to the marine living resources to which this Convention applies;
(c) each regional economic integration organization which has acceded to this Convention pursuant to Article XXIX shall be entitled to be a Member of the Commission during such time as its States members are so entitled;
(d) Contracting Party seeking to participate in the work of the Commission pursuant to sub-paragraphs (b) and (c) above shall notify the Depositary of the basis upon which it seeks to become a Member of the Commission and of its willingness to accept conservation measures in force. The Depositary shall communicate to each member of the Commission such notification and accompanying information. Within two months of receipt of such communication from the Depositary, any Member of the Commission may request that a special meeting of the Commission be held to consider the matter. Upon receipt of such
request, the Depositary shall call such a meeting. If there is not request for a meeting, the Contracting Party submitting the notification shall be deemed to have satisfied the requirements for Commission Membership.
3. Each Member of the Commission shall be represented by one representative who may be accompanied by alternate representatives and advisers.

Article VIII

The Commission shall have legal personality and shall enjoy in the territory of each of the States Parties such legal capacity as may be necessary to perform its function and achieve the purposes of this Convention. The privileges and immunities to be enjoyed by the Commission and its staff in the territory of a State Party shall be determined by agreement between the Commission and the State Party concerned.

Article IX

1. The function of the Commission shall be to give effect to the objective and principles set out in Article II of this Convention. To this end, it shall:
(a) facilitate research into and comprehensive studies of Antarctic marine living resources and of the Antarctic marine ecosystem;
(b) compile data on the status of and changes in population of Antarctic marine living resources and on factors affecting the distribution, abundance and productivity of harvested species and dependent or related species or populations;
(c) ensure the acquisition of catch and effort statistics on harvested populations;
(d) analyse, disseminate and publish the information referred to in sub-paragraphs (b) and (c) above and the reports of the Scientific Committee;
(e) identify conservation needs and analyse the effectiveness of conservation measures;
(f) formulate, adopt and revise conservation measures on the basis of the best scientific evidence available, subject to the provisions of paragraph 5 of this Article;
(g) implement the system of observation and inspection established under Article XXIV of this Convention;
(h) carry out such other activities as are necessary to fulfil the objective of this Convention.
2. The conservation measures referred to in paragraph 1(f) above include the following:
(a) the designation of the quantity of any species which may be harvested in the area to which this Convention applies;
(b) the designation of regions and sub-regions based on the distribution of populations of Antarctic marine living resources;
(c) the designation of the quantity which may be harvested from the populations of regions and sub-regions;
(d) the designation of protected species;
(e) the designation of the size, age and, as appropriate, sex of species which may be harvested;
(f) the designation of open and closed season for harvesting;

(g) the designation of the opening and closing of areas, regions or sub-regions for purposes of scientific study or conservation, including special areas for protection and scientific study;
(h) regulation of the effort employed and methods of harvesting, including fishing gear, with a view, inter alia, to avoiding undue concentration of harvesting in any region or sub-region;
(i) the taking of such other conservation measures as the Commission considers necessary for the fulfilment of the objective of this Convention, including measures concerning the effects of harvesting and associated activities on components of the marine ecosystem other than the harvested populations.
3. The Commission shall publish and maintain a record of all conservation measures in force.
4. In exercising its functions under paragraph 1 above, the Commission shall take full account of the recommendations and advice of the Scientific Committee.
5. The Commission shall take full account of the any relevant measures or regulations established or recommended by the Consultative Meetings pursuant to Article IX of the Antarctic Treaty or by existing fisheries commissions responsible for species which may enter the area to which this Convention applies, in order that there shall be no inconsistency between the rights and obligations of a Contracting Party under such regulations or measures and conservation measures which may be adopted by the Commission.
6. Conservation measures adopted by the Commission in accordance with this Convention shall be implemented by Members of the Commission in the following manner;
(a) the Commission shall notify conservation measures to all Members of the Commission;
(b) conservation measures shall become binding upon all Members of the Commission 180 days after such notification, except as provided in sub-paragraphs (c) and (d) below;
(c) if a Member of the Commission, within ninety days following the notification specified in measure, in whole or in part, the measure shall not, to the extent stated, be binding upon that member of the Commission;
(d) in the event that any Member of the Commission invokes the procedure set forth in sub-paragraph (c) above, the Commission shall meet at the request of any Member of the Commission to review the conservation measure. At the time of such meeting and within thirty days following the meeting, any Member of the Commission shall have the right to declare that it is no longer able to accept the conservation measure, in which case the Member shall no longer be bound by such measure.

Article X

1. The Commission shall draw the attention of any State which is not a Party to this Convention to any activity undertaken by its nationals or vessels which, in the opinion of the Commission, affects the implementation of the objective of this Convention.
2. The Commission shall draw the attention of all Contracting Parties to any activity which, in the opinion of the Commission, affects the implementation by a Contracting Party of the objective of this Convention or the compliance by that Contracting Party with its obligations under this Convention.

Article XI

The Commission shall seek to co-operate with Contracting Parties which may exercise jurisdiction in marine areas adjacent to the area to which this Convention applies in respect of the conservation of any stock or stocks of associated species which occur both within those areas and the area to which this Convention applies, with a view to harmonising the conservation measures adopted in respect of such stocks.

Article XII

1. Decisions of the Commission on matters of substance shall be taken by consensus. The question of whether a matter is one of substance shall be treated as a matter of substance.

2. Decisions on matters other than those referred to in paragraph 1 above shall be taken by a simple majority of the Members of the Commission present and voting.
3. In Commission consideration of any item requiring a decision, it shall be made clear whether a regional economic integration organization will participate in the taking of the decision and, if so, whether any of its member States will also participate. The number of Contracting Parties so participating shall not exceed the number of member States of the regional economic integration organization which are Members of the Commission.
4. In the taking of decisions pursuant to this Article, a regional economic integration organization shall have only one vote.

Article XIII

1. The Headquarters of the Commission shall be established at Hobart, Tasmania, Australia.
2. The Commission shall hold a regular annual meeting. Other meetings shall also be held at the request of one-third of its members and as otherwise provided in this Convention. The first meeting of the Commission shall be held within three months of the entry into force of this Convention, provided that among the Contracting Parties there are at least two States conducting harvesting activities within the area to which this Convention applies. The first meeting shall, in any event, be held within one year of the entry into force of this Convention. The Depositary shall consult with the signatory States regarding the first Commission meeting, taking into account that a broad representation of such States is necessary for the effective operation of the Commission.
3. The Depositary shall convene the first meeting of the Commission at the headquarters of the Commission. Thereafter, meetings of the Commission shall be held at its headquarters, unless it decides otherwise.
4. The Commission shall elect from among its members a Chairman and Vice-Chairman, each of whom shall serve for a term of two years and shall be eligible for re-election for one additional term. The first Chairman shall, however, be elected for an initial term of three years. The Chairman and Vice-Chairman shall not be representatives of the same Contracting Party.
5. The Commission shall adopt and amend as necessary the rules of procedure for the conduct of its meetings, except with respect to the matters dealt with in Article XII of this Convention.
6. The Commission may establish such subsidiary bodies as are necessary for the performance of its functions.

Article XIV

1. The Contracting Parties hereby establish the Scientific Committee for the Conservation of Antarctic Marine Living Resources (hereinafter referred to as `the Scientific Committee') which shall be a consultative body to the Commission. The Scientific Committee shall normally meet at the headquarters of the Commission unless the Scientific Committee decides otherwise.
2. Each Member of the Commission shall be a member of the Scientific Committee and shall appoint a representative with suitable scientific qualifications who may be accompanied by other experts and advisers.
3. The Scientific Committee may seek the advice of other scientists and experts as may be required on an ad hoc basis.

Article XV

1. The Scientific Committee shall provide a forum for consultation and co-operation concerning the collection, study and exchange of information with respect to the marine living resources to which this Convention applies. It shall encourage and promote co-operation in the field of scientific research in order to extend knowledge of the marine living resources of the Antarctic marine ecosystem.
2. The Scientific Committee shall conduct such activities as the Commission may direct in pursuance of the objective of this Convention and shall:

(a) establish criteria and methods to be used for determinations concerning the conservation measures referred to in Article IX of this Convention;
(b) regularly assess the status and trends of the populations of Antarctic marine living resources;
(c) analyse data concerning the direct and indirect effects of harvesting on the populations of Antarctic marine living resources;
(d) assess the effects of proposed changes in the methods or levels of harvesting and proposed conservation measures;
(e) transmit assessments, analyses, reports and recommendations to the Commission as requested or on its own initiative regarding measures and research to implement the objective of this Convention;
(f) formulate proposals for the conduct of international and national programs of research into Antarctic marine living resources.
3. In carrying out its functions, the Scientific Committee shall have regard to the work of other relevant technical and scientific organizations and to the scientific activities conducted within the framework of the Antarctic Treaty.

Article XVI

1. The first meeting of the Scientific Committee shall be held within three months of the first meeting of the Commission. The Scientific Committee shall meet thereafter as often as may be necessary to fulfil its functions.
2. The Scientific Committee shall adopt and amend as necessary its rules of procedure. The rules and any amendments thereto shall be approved by the Commission. The rules shall include procedures for the presentation of minority reports.
3. The Scientific Committee may establish, with the approval of the Commission, such subsidiary bodies as are necessary for the performance of its functions.

Article XVII

1. The Commission shall appoint an Executive Secretary to serve the Commission and Scientific Committee according to such procedures and on such terms and conditions as the Commission may determine. His term of office shall be for four years and he shall be eligible for re-appointment.
2. The Commission shall authorize such staff establishment for the Secretariat as may be necessary and the Executive Secretary shall appoint, direct and supervise such staff according to such rules and procedures and on such terms and conditions as the Commission may determine.
3, The Executive Secretary and Secretariat shall perform the functions entrusted to them by the Commission.

Article XVIII

The official languages of the Commission and of the Scientific Committee shall be English, French, Russian and Spanish.

Article XIX

1. At each annual meeting, the Commission shall adopt by consensus its budget and the budget of the Scientific Committee.
2. A draft budget for the Commission and the Scientific Committee and any subsidiary bodies shall be prepared by the Executive Secretary and submitted to the Members of the Commission at least sixty days before the annual meeting of the Commission.
3. Each Member of the Commission shall contribute to the budget. Until the expiration of five years after the entry into force of this Convention, the contribution of each Member of the Commission shall be equal. Thereafter the contribution shall be determined in accordance with two criteria: the amount harvested and an equal sharing among all Members of the Commission. The Commission shall determine by consensus the proportion in which these two criteria shall apply.

4. The financial activities of the Commission and Scientific Committee shall be conducted in accordance with financial regulations adopted by the Commission and shall be subject to an annual audit by external auditors selected by the Commission.
5. Each Member of the Commission shall meet its own expenses arising from attendance at meetings of the Commission and of the Scientific Committee.
6. A Member of the Commission that fails to pay its contributions for two consecutive years shall not, during the period of its default, have the right to participate in the taking of decisions in the Commission.

Article XX

1. The Members of the Commission shall, to the greatest extent possible, provide annually to the Commission and to the Scientific Committee such statistical, biological and other data and information as the Commission and Scientific Committee may require in the exercise of their functions.
2. The Members of the Commission shall provide, in the manner and at such intervals as may be prescribed, information about their harvesting activities, including fishing areas and vessels, so as to enable reliable catch and effort statistics to be compiled.
3. The Members of the Commission shall provide to the Commission at such intervals as may be prescribed information on steps taken to implement the conservation measures adopted by the Commission.
4. The Members of the Commission agree that in any of their harvesting activities, advantage shall be taken of opportunities to collect data needed to assess the impact of harvesting.

Article XXI

1. Each Contracting Party shall take appropriate measures within its competence to ensure compliance with the provisions of this Convention and with conservation measures adopted by the Commission to which the Party is bound in accordance with Article IX of this Convention.
2. Each Contracting Party shall transmit to the Commission information on measures taken pursuant to paragraph 1 above, including the imposition of sanctions for any violation.

Article XXII

1. Each Contracting Party undertakes to exert appropriate efforts, consistent with the Charter of the United Nations, to the end that no one engages in any activity contrary to the objective of this Convention.
2. Each Contracting Party shall notify the Commission of any such activity which comes to its attention.

Article XXIII

1. The Commission and the Scientific Committee shall co-operate with the Antarctic Treaty Consultative Parties on matters falling within the competence of the latter.
2. The Commission and the Scientific Committee shall co-operate, as appropriate, with the Food and Agriculture Organisation of the United Nations and with other Specialised Agencies.
3. The Commission and the Scientific Committee shall seek to develop co-operative working relationships, as appropriate, with inter-governmental and non-governmental organizations which could contribute to their work, including the Scientific Committee on Antarctic Research, the Scientific Committee on Oceanic Research and the International Whaling Commission.
4. The Commission may enter into agreements with the organizations referred to in this Article and with other organizations as may be appropriate. The Commission and the Scientific Committee may invite such organizations to send observers to their meetings and to meetings of their subsidiary bodies.

Article XXIV

1. In order to promote the objective and ensure observance of the provisions of this Convention, the Contracting Parties agree that a system of observation and inspection shall be established.
2. The system of observation and inspection shall be elaborated by the Commission on the basis of the following principles:
(a) Contracting Parties shall co-operate with each other to ensure the effective implementation of the system of observation and inspection, taking account of the existing international practice. This system shall include, inter alia, procedures for boarding and inspection by observers and inspectors designated by the Members of the Commission and procedures for flag state prosecution and sanctions on the basis of evidence resulting from such boarding and inspections. A report of such prosecutions and sanctions imposed shall be included in the information referred to in Article XXI of this Convention;
(b) in order to verify compliance with measures adopted under this Convention, observation and inspection shall be carried out on board vessels engaged in scientific research or harvesting of marine living resources in the area to which this Convention applies, through observers and inspectors designated by the Members of the Commission and operating under terms and conditions to be established by the Commission.
(c) designated observers and inspectors shall remain subject to the jurisdiction of the Contracting Party of which they are nationals. They shall report to the Member of the Commission by which they have been designated which in turn shall report to the Commission.
3. Pending the establishment of the system of observation and inspection, the Members of the Commission shall seek to establish interim arrangements to designate observers and inspectors and such designated observers and inspectors shall be entitled to carry out inspections in accordance with the principles set out in paragraph 2 above.

Article XXV

1. If any dispute arises between two or more of the Contracting Parties concerning the interpretation or application of this Convention, those Contracting Parties shall consult among themselves with a view to having the dispute resolved by negotiation, inquiry, mediation, conciliation, arbitration, judicial settlement or other peaceful means of their own choice.
2. Any dispute of this character not so resolved shall, with the consent in each case of all Parties to the dispute, be referred for settlement to the International Court of Justice or to arbitration; but failure to reach agreement on reference to the International Court or to arbitration shall not absolve Parties to the dispute from the responsibility of continuing to seek to resolve it by any of the various peaceful means referred to in paragraph 1 above.
3. In cases where the dispute is referred to arbitration, the arbitral tribunal shall be constituted as provided in the Annex to this Convention.

Article XXVI

1. This Convention shall be open for signature at Canberra from 1 August to 31 December 1980 by the States participating in the Conference on the Conservation of Antarctic Marine Living Resources held at Canberra from 7 to 20 May 1980.
2. The States which so sign will be the original signatory States of the Convention.

Article XXVII

1. This Convention is subject to ratification, acceptance or approval by signatory States.
2. Instruments of ratification, acceptance or approval shall be deposited with the Government of Australia, hereby designated as the Depositary.

Article XXVIII

1. This Convention shall enter into force on the thirtieth day following the date of deposit of the eighth instrument of ratification, acceptance or approval by States referred to in paragraph 1 of Article XXVI of this Convention.
2. With respect to each State or regional economic integration organization which subsequent to the date of entry into force of this Convention deposits an instrument of ratification, acceptance, approval or accession, the Convention shall enter into force on the thirtieth day following such deposit.

Article XXIX

1. This Convention shall be open for accession by any State interested in research or harvesting activities in relation to the marine living resources to which this Convention applies.
2. This Convention shall be open for accession by regional economic integration organizations constituted by sovereign States which include among their members one or more States Members of the Commission and to which the States members of the organization have transferred, in whole or in part, competences with regard to the matters covered by this Convention. The accession of such regional economic integration organizations shall be the subject of consultations among Members of the Commission.

Article XXX

1. This Convention may be amended at any time.
2. If one-third of the Members of the Commission request a meeting to discuss a proposed amendment the Depositary shall call such a meeting.
3. An amendment shall enter into force when the Depositary has received instruments of ratification, acceptance or approval thereof from all the Members of the Commission.
4. Such amendment shall thereafter enter into force as to any other Contracting Party when notice of ratification, acceptance or approval has been received by the Depositary. Any such Contracting Party from which no such notice has been received within a period of one year from the date of entry into force of the amendment in accordance with paragraph 3 above shall be deemed to have withdrawn from this Convention.

Article XXXI

1. Any Contracting Party may withdraw from this Convention on 30 June of any year, by giving written notice not later than 1 January of the same year to the Depositary, which, upon receipt of such a notice, shall communicate it forthwith to the other Contracting Parties.
2. Any other Contracting Party may, within sixty days of the receipt of a copy of such a notice from the Depositary, give written notice of withdrawal to the Depositary in which case the Convention shall cease to be in force on 30 June of the same year with respect to the Contracting Party giving such notice.
3. Withdrawal from this Convention by any Member of the Commission shall not affect its financial obligations under this Convention.

Article XXXII

The Depositary shall notify all Contracting Parties of the following:

(a) signatures of this Convention and the deposit of instruments of ratification, acceptance, approval or accession;
(b) the date of entry into force of this Convention and of any amendment thereto.

Article XXXIII:

1. This Convention, of which the English, French, Russian and Spanish texts are equally authentic, shall be deposited with the Government of Australia which shall transmit duly certified copies thereof to all signatory and acceding Parties.

2. This Convention shall be registered by the Depositary pursuant to Article 102 of the Charter of the United Nations.

Drawn up at Canberra this twentieth day of May 1980.

IN WITNESS THEREOF the undersigned, being duly authorized, have signed this Convention.

Annex for an Arbitral Tribunal

The arbitral tribunal referred to in paragraph 3 of Article XXV shall be composed of three arbitrators who shall be appointed as follows:

The Party commencing proceedings shall communicate the name of an arbitrator to the other Party which, in turn, within a period of forty days following such notification, shall communicate the name of the second arbitrator. The Parties shall, within a period of sixty days following the appointment of the second arbitrator, appoint the third arbitrator, who shall not be a national of either Party and shall not be of the same nationality as either of the first two arbitrators. The third arbitrator shall preside over the tribunal.

If the second arbitrator has not been appointed within the prescribed period, or if the Parties have not reached agreement within the prescribed period on the appointment of the third arbitrator, that arbitrator shall be appointed, as the request of either Party, by the Secretary-General of the Permanent Court of Arbitration, from among persons of international standing not having the nationality of a State which is a Party to this Convention.

The arbitral tribunal shall decide where its headquarters will be located and shall adopt its own rules of procedure.

The award of the arbitral tribunal shall be made by a majority of its members, who may not abstain from voting.

Any Contracting Party which is not a Party to the dispute may intervene in the proceedings with the consent of the arbitral tribunal.

The award of the arbitral tribunal shall be final and binding on all Parties to the dispute and on any Party which intervenes in the proceedings and shall be complied with without delay. The arbitral tribunal shall interpret the award at the request of one of the Parties to the dispute or of any intervening Party.

Unless the arbitral tribunal determines otherwise because of the particular circumstances of the case, the expenses of the tribunal, including the remuneration of its members, shall be borne by the Parties to the dispute in equal shares.

Appendix III: Table of Conservation Measures in Force 2000/2001

Code	Conservation Measure Title
CM 2/III	Mesh Size
CM 3/IV	Prohibition of Directed Fishery on *Notothenia rossii* around South Georgia (Statistical Subarea 48.3)
CM 4/V	Regulation on Mesh Size Measurement
CM 5/V	Prohibition of Directed Fishery on *Notothenia rossii* in the Peninsula Area (Statistical Subarea 48.1)
CM 6/V	Prohibition of Directed Fishery on *Notothenia rossii* around South Orkneys (Statistical Subarea 48.2)
CM 7/V	Regulation of Fishing around South Georgia (Statistical Subarea 48.3)
CM 19/IX	Mesh Size for *Champsocephalus gunnari*
CM 29/XIX	Minimisation of the Incidental Mortality of Seabirds in the Course of Longline Fishing or Longline Fishing Research in the Convention Area
CM 31/X	Notification that Members are Considering Initiating a New Fishery
CM 32/XIX	Precautionary Catch Limitations on Euphausia superba in Statistical Area 48
CM 40/X	Monthly Catch and Effort Reporting System
CM 45/XIV	Precautionary Catch Limitation on *Euphausia superba* in Statistical Division 58.4.2
CM 51/XIX	Five-day Catch and Effort Reporting System
CM 61/XII	Ten-day Catch and Effort Reporting System
CM 63/XV	Regulation of the Use and Disposal of Plastic Packaging Bands on Fishing Vessels
CM 64/XIX	The Application of Conservation Measures to Scientific Research
CM 65/XII	Exploratory Fisheries
CM 72/XVII	Prohibition of Directed Fishing for Finfish in Statistical Subarea 48.1
CM 73/XVII	Prohibition of Directed Fishing for Finfish in Statistical Subarea 48.2
CM 95/XIV	Limitation of the By-Catch of *Gobionotothen gibberifrons, Chaenocephalus aceratus, Pseudochaenichthys georgianus, Notothenia rossii* and *Lepidonotothen squamifrons* in Statistical Subarea 48.3.
CM 106/XIX	Precautionary Catch Limitation on Euphausia superba in Statistical Division 58.4.1
CM 118/XVII	Scheme to Promote Compliance by Non-Contracting Party Vessels with CCAMLR Conservation Measures
CM 119/XVII	Licensing and Inspection Obligations of Contracting Parties with regard to their Flag Vessels Operating in the Convention Area
CM 121/XIX	Monthly Fine-Scale Biological Data Reporting System for Trawl, Longline and Pot Fisheries
CM 122/XIX	Monthly Fine-Scale Catch and Effort Data Reporting System for Trawl, Longline and Pot Fisheries
CM 129/XVI	Prohibition of Directed Fishing for *Lepidonotothen squamifrons* in Sataistical Division 58.4.4 (Ob and Lena Banks)
CM 146/XVII	Marking of Fishing Vessels and Fishing Gear
CM 147/XIX	Provisions to ensure Compliance with CCAMLR Conservation Measures by Vessels, including Cooperation between Contracting Parties
CM 148/XVII	Automated Satellite-Linked Vessel monitoring Systems (VMS)
CM 160/XVII	Prohibition of Directed Fishing for *Dissostichus eleginoides* in Statistical Subarea 58.7
CM 170/XIX	Catch Documentation Scheme for Dissostichus spp.
CM 171/XVIII	Prohibition of Directed Fishery on *Gobionotothen gibberifrons, Chaenocephalus aceratus, Pseudochaenichthys georgianus, Notothenia rossii* and *Lepidonotothen squamifrons* in Statistical Subarea 48.3.

CM 173/XVIII	Minimisation of the Incidental Mortality of Seabirds and Marine Mammals in the Course of Trawl Fishing in the Convention Area.
CM 180/XVIII	Catch Limit on *Dissostichus eleginoides* and *Dissostichus mawsoni* in Statistical Subarea 48.4
CM 192/XIX	Directed Fishing for Dissostichus spp. in the 2000/01 Season
CM 193/XIX	Prohibition on Directed Fishing for Dissostichus spp. except in accordance with Specific Conservation Measures in the 2000/01 Season
CM 194/XIX	Limitation of the Total Catch of Champsocephalus gunnari in Statistical Subarea 48.3 in the 2000/01 Season
CM 195/XIX	Fishery for Champsocephalus gunnari in Statistical Division 58.5.2 in the 2000/01 Season
CM 196/XIX	Limits on the Fishery for Dissostichus eleginoides in Statistical Subarea 48.3 in the 2000/01 Season
CM 197/XIX	Fishery for Dissostichus eleginoides in Statistical Division 58.5.2 in the 2000/01 Season
CM 198/XIX	Limitation of the By-catch in Statistical Division 58.5.2 in the 2000/01 Season
CM 199/XIX	Precautionary Catch Limit for Electrona carlsbergi in Statistical Subarea 48.3 in the 2000/01 Season
CM 200/XIX	General Measures for Exploratory Fisheries for Dissostichus spp. in the Convention Area in the 2000/01 Season
CM 201/XIX	Limitation of By-catch in the Exploratory Fisheries in Statistical Divisions 58.4.1, 58.4.2 and 58.4.3 in the 2000/01 Season
CM 202/XIX	Exploratory Longline Fishery for Dissostichus spp. in Statistical Subarea 48.6 in the 2000/01 Season
CM 203/XIX	Exploratory Trawl Fishery for Dissostichus spp.on BANZARE Bank in the 2000/01 Season
CM 204/XIX	Exploratory Longline Fishery for Dissostichus spp. on BANZARE Bank outside Areas under National Jurisdictions in the 2000/01 Season
CM 205/XIX	Exploratory Trawl Fishery for Dissostichus spp. on Elan Bank (Statistical Division 58.4.3) in the 2000/01 Season
CM 206/XIX	Exploratory Longline Fishery for Dissostichus spp. on Elan Bank (Statistical Division 58.4.3) outside Areas under National Jurisdictions in the 2000/2001 Season
CM 207/XIX	Exploratory Trawl Fishery for Dissostichus spp. in Statistical Division 58.4.2 in the 2000/01 Season
CM 208/XIX	Exploratory Longline Fishery for Dissostichus eleginoides in Statistical Division 58.4.4 in the 2000/01 Season
CM 209/XIX	Exploratory Longline Fishery for Dissostichus eleginoides in Statistical Subarea 58.6 in the 2000/01 Season
CM 210/XIX	Exploratory Longline Fishery for Dissostichus spp. in Statistical Subarea 88.1 in the 2000/01 Season
CM 211/XIX	Exploratory Longline Fishery for Dissostichus spp. in Statistical Subarea 88.2 in the 2000/01 Season
CM 212/XIX	Exploratory Trawl Fishery for Chaenodraco wilsoni, Lepidonotothen kempi, Trematomus eulepidotus and Pleuragramma antarcticum in Statistical Division 58.4.2 in the 2000/01 Season
CM 213/XIX	Exploratory Fishery for Martialia hyadesi in Statistical Subarea 48.3 in the 2000/01 Season
CM 214/XIX	Experimental Harvest Regime for the Crab Fishery in Statistical Subarea 48.3 in the 2000/01 Season
CM 215/XIX	Limits on the Crab Fishery in Statistical Subarea 48.3 in the 2000/01 Season
Resolution 13/XIX	Flagging and Licensing of Non-Contracting Party Vessels

Resolution 14/XIX	Catch Documentation Scheme: Implementation by Acceding States and Non-Contracting Parties
Resolution 15/XIX	Use of Ports not Implementing the Catch Documentation Scheme for Dissostichus spp.
Resolution 16/XIX	Application of VMS in the Catch Documentation Scheme
CM 18/XIX	Procedure for According Protection to CEMP Sites
CM 62/XIX	Protection of the Seal Islands CEMP Site
CM 82/XIX	Protection of the Cape Shirreff CEMP Site

Highlighted measures and resolutions have been reproduced in full (below).

Appendix IV: Selected Conservation Measures

CONSERVATION MEASURE 29/XIX [1,2]
Minimisation of the Incidental Mortality of Seabirds in the Course of Longline Fishing or Longline Fishing Research in the Convention Area

The Commission,
Noting the need to reduce the incidental mortality of seabirds during longline fishing by minimising their attraction to fishing vessels and by preventing them from attempting to seize baited hooks, particularly during the period when the lines are set, Adopts the following measures to reduce the possibility of incidental mortality of seabirds during longline fishing.

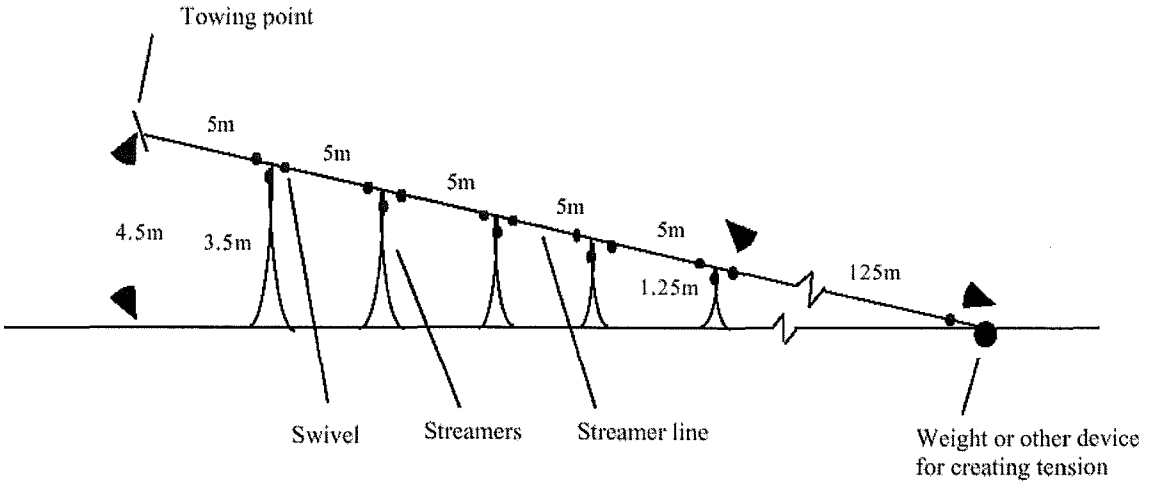
1. Fishing operations shall be conducted in such a way that the baited hooks sink as soon as possible after they are put in the water. Only thawed bait shall be used.
2. For vessels using the Spanish method of longline fishing, weights should be released before line tension occurs; weights of at least 8.5 kg mass shall be used, spaced at intervals of no more than 40 m, or 6 kg mass shall be used, spaced at intervals of no more than 20 m.
3. Longlines shall be set at night only (i.e. during the hours of darkness between the times of nautical twilight [3]) [4]. During longline fishing at night, only the minimum ship's lights necessary for safety shall be used.
4. The dumping of offal is prohibited while longlines are being set. The dumping of offal during the haul shall be avoided. Any such discharge shall take place only on the
opposite side of the vessel to that where longlines are hauled.
5. Vessels which are so configured that they lack on-board processing facilities or adequate capacity to retain offal on board, or the ability to discharge offal on the opposite side of the vessel to that where longlines are hauled, shall not be authorised to fish in the Convention Area.
6. A streamer line designed to discourage birds from settling on baits during deployment of longlines shall be towed. Specification of the streamer line and its method of deployment is given in the appendix to this measure. Details of the construction relating to the number and placement of swivels may be varied so long as the effective sea surface covered by the streamers is no less than that covered by the currently specified design. Details of the device dragged in the water in order to create tension in the line may also be varied.
7. Other variations in the design of streamer lines may be tested on vessels carrying two observers, at least one appointed in accordance with the CCAMLR Scheme of
International Scientific Observation, providing that all other elements of this conservation measure are complied with [5].

8. Every effort should be made to ensure that birds captured alive during longlining are released alive and that wherever possible hooks are removed without jeopardising the life of the bird concerned.

1 Except for waters adjacent to the Kerguelen and Crozet Islands
2 Except for waters adjacent to the Prince Edward Islands
3 The exact times of nautical twilight are set forth in the Nautical Almanac tables for the relevant latitude, local time and date. All times, whether for ship operations or observer reporting, shall be referenced to GMT.
4 Wherever possible, setting of lines should be completed at least three hours before sunrise (to reduce loss of bait to/catches of white-chinned petrels).
5 The streamer lines under test should be constructed and operated taking full account of the principles set out in WG-IMALF-94/19 (available from the CCAMLR Secretariat); testing should be carried out independently of actual commercial fishing and in a manner consistent with the spirit of Conservation Measure 65/XII.

APPENDIX TO CONSERVATION MEASURE 29/XIX
1. The streamer line is to be suspended at the stern from a point approximately 4.5 m above the water and such that the line is directly above the point where the baits hit the water.

2. The streamer line is to be approximately 3 mm diameter, have a minimum length of 150 m and have a device at the end to create tension so that the main line streams directly behind the ship even in cross winds.
3. At 5 m intervals commencing from the point of attachment to the ship five branch streamers each comprising two strands of approximately 3 mm diameter cord should be attached. The length of the streamer should range between approximately 3.5 m nearest the ship to approximately 1.25 m for the fifth streamer. When the streamer line is deployed the branch streamers should reach the sea surface and periodically dip into it as the ship heaves. Swivels should be placed in the streamer line at the towing point, before and after the point of attachment of each branch streamer and immediately before any weight placed on the end of the streamer line. Each branch streamer should also have a swivel at its attachment to the streamer line.



CONSERVATION MEASURE 118/XVII
Scheme to Promote Compliance by Non-Contracting Party Vessels with CCAMLR Conservation Measures

The Commission hereby adopts the following conservation measure in accordance with Article IX.2(i) of the Convention:

1. A non-Contracting Party vessel which has been sighted engaging in fishing activities in the Convention Area is presumed to be undermining the effectiveness of CCAMLR conservation measures. In the case of any transhipment activities involving a sighted non-Contracting Party vessel inside or outside the Convention Area, the presumption of undermining the effectiveness of CCAMLR conservation measures applies to any other non-Contracting Party vessel which has engaged in such activities with that vessel.

2. Information regarding such sightings shall be transmitted immediately to the Commission in accordance with Article XXII of the Convention. The Secretariat shall transmit this information to all Contracting Parties within one business day of receiving this information, and to the Flag State of the sighted vessel as soon as possible.

3. The Contracting Party which sights the non-Contracting Party vessel shall attempt to inform the vessel that it has been sighted engaging in fishing activities in the Convention Area and is accordingly presumed to be undermining the objective of the Convention and that this information will be distributed to all Contracting Parties to the Convention and to the Flag State of the vessel.

4. When a non-Contracting Party vessel referred to in paragraph 1 enters a port of any Contracting Party, it shall be inspected by authorised Contracting Party officials knowledgeable of CCAMLR conservation measures and shall not be allowed to land or tranship any fish until this inspection has

taken place. Such inspections shall include the vessel's documents, logbooks, fishing gear, catch on board and any other matter, which may include information from a VMS [1], relating to the vessel's activities in the Convention Area.

5. Landing and transhipments of all fish from a non-Contracting Party vessel, which has been inspected pursuant to paragraph 4, shall be prohibited in all Contracting Party ports if such inspection reveals that the vessel has on board species subject to CCAMLR conservation measures, unless the vessel establishes that the fish were caught outside the Convention Area or in compliance with all relevant CCAMLR conservation measures and requirements under the Convention.

6. Contracting Parties shall ensure that their vessels do not receive transhipments of fish from a non-Contracting Party vessel which has been sighted and reported as having engaged in fishing activities in the Convention Area and therefore presumed as having undermined the effectiveness of CCAMLR conservation measures.

7. Information on the results of all inspections of non-Contracting Party vessels conducted in the ports of Contracting Parties, and on any subsequent action, shall be transmitted immediately to the Commission. The Secretariat shall transmit this information immediately to all Contracting Parties and to the relevant Flag State(s).

1 The term VMS shall be taken to mean a system which operates to the same standard as defined in Conservation Measure 148/XVII.

CONSERVATION MEASURE 119/XVII [1,2]
Licensing and Inspection Obligations of Contracting Parties with regard to their Flag Vessels Operating in the Convention Area

1. Each Contracting Party shall prohibit fishing by its flag vessels in the Convention Area except pursuant to a licence 3 that the Contracting Party has issued setting forth the specific areas, species and time periods for which such fishing is authorised and all other specific conditions to which the fishing is subject to give effect to CCAMLR conservation measures and requirements under the Convention.

2. A Contracting Party may only issue such a licence to fish in the Convention Area to vessels flying its flag, if it is satisfied of its ability to exercise its responsibilities under the Convention and its conservation measures, by requiring from each vessel, *inter alia*, the following:

(i) timely notification by the vessel to its Flag State of exit from and entry into any port;

(ii) notification by the vessel to its Flag State of entry into the Convention Area and movement between areas, subareas/divisions;

(iii) reporting by the vessel of catch data in accordance with CCAMLR requirements; and

(iv) operation of a VMS system on board the vessel in accordance with Conservation Measure 148/XVII.

3. The licence or an authorised copy of the licence must be carried by the fishing vessel and must be available for inspection at any time by a designated CCAMLR inspector in the Convention Area.

4. Each Contracting Party shall verify, through inspections of all of its fishing vessels at the Party's departure and arrival ports, and where appropriate, in its Exclusive Economic Zone, their

compliance with the conditions of the licence as described in paragraph 1 and with the CCAMLR conservation measures. In the event that there is evidence that the vessel has not fished in accordance with the conditions of its licence, the Contracting Party shall investigate the infringement and, if necessary, apply appropriate sanctions in accordance with its national legislation.

5. Each Contracting Party shall include in its annual report pursuant to paragraph 12 of the CCAMLR System of Inspection, steps it has taken to implement and apply this conservation measure; and may include additional measures it may have taken in relation to its flag vessels to promote the effectiveness of CCAMLR conservation measures.

1 Except for waters adjacent to the Kerguelen and Crozet Islands
2 Except for waters adjacent to the Prince Edward Islands
3 Includes permit

CONSERVATION MEASURE 146/XVII 1
Marking of Fishing Vessels and Fishing Gear

The Commission hereby adopts the following conservation measure in accordance with Article IX of the Convention:

1. All Contracting Parties shall ensure that their fishing vessels licensed 2 in accordance with Conservation Measure 119/XVII to operate in the Convention Area are marked in such a way that they can be readily identified in accordance with internationally recognised standards, such as the FAO Standard Specifications and Guidelines for the Marking and Identification of Fishing Vessels.

2. Marker buoys and similar objects floating on the surface and intended to indicate the location of fixed or set fishing gear shall be clearly marked at all times with the letter(s) and/or numbers of the vessels to which they belong.

1 Except for waters adjacent to Kerguelen and Crozet Islands
2 Includes permitted

CONSERVATION MEASURE 147/XIX 1
Provisions to ensure Compliance with CCAMLR Conservation Measures by Vessels, including Cooperation between Contracting Parties

1. Contracting Parties shall undertake inspections of those fishing vessels that intend to land or tranship *Dissostichus* spp. at their ports. The inspection shall be for the purpose of determining that the catch to be unloaded or transhipped is accompanied by the *Dissostichus* catch document required by Conservation Measure 170/XIX, that the catch agrees with the information recorded on the document and, if the vessel carried out harvesting activities in the Convention Area, that these activities were carried out in accordance with CCAMLR conservation measures.
2. To facilitate these inspections, Contracting Parties shall require vessels to provide advance notice of their entry into port and to convey a written declaration that they have not engaged in or supported illegal, unregulated and unreported (IUU) fishing in the Convention Area. The inspection shall be conducted within 48 hours of port entry and shall be carried out in an expeditious fashion. It shall impose no undue burdens on the vessel or its crew, and shall be guided by the relevant provisions of the CCAMLR System of Inspection. Vessels which either declare that they have been involved in IUU fishing or fail to make a declaration shall be denied port access, other than for emergency purposes.
3. In the event that there is evidence that the vessel has fished in contravention of the CCAMLR conservation measures, the catch shall not be landed or transhipped. The Contracting Party will inform the Flag State of the vessel of its inspection findings and will cooperate with the Flag State

in taking such appropriate action as is required to investigate the alleged infringement, and, if necessary, apply appropriate sanctions in accordance with national legislation.
4. Contracting Parties shall promptly advise the Secretariat of any vessels denied port access or permission to land or transhipment *Dissostichus* spp. The Secretariat shall promptly convey such reports to all Contracting Parties.

1 Except for waters adjacent to the Kerguelen and Crozet Islands

CONSERVATION MEASURE 148/XVII Automated Satellite-Linked Vessel Monitoring Systems (VMS)

The Commission hereby adopts the following conservation measure in accordance with Article IX of the Convention:

1. Each Contracting Party shall, no later than 1 March 1999, establish an automated Vessel Monitoring System (VMS) to monitor the position of its fishing vessels, which are licensed 1 in accordance with Conservation Measure 119/XVII, to harvest marine living resources in the Convention Area, and for which catch limits, fishing seasons or area restrictions have been set by conservation measures adopted by the Commission.

2. Any Contracting Party unable to establish VMS in accordance with paragraph 1 shall inform the CCAMLR Secretariat within 90 days following the notification of this conservation measure, and communicate its intended timetable for implementation of VMS. However, the Contracting Party shall establish VMS at the earliest possible date, and in any event, no later than 31 December 2000.

3. The implementation of VMS on vessels while participating only in a krill fishery is not currently required.

4. For the purpose of this Measure, VMS means a system where, *inter alia*:

(i) through the installation of satellite-tracking devices on board its fishing vessels, the Flag State receives automatic transmission of certain information. This information includes the fishing vessel identification, location, date and time, and is collected by the Flag State at least every four hours to enable it to monitor effectively its flag vessels;

(ii) performance standards provide, as a minimum, that the VMS:

(a) is tamper proof;

(b) is fully automatic and operational at all times regardless of environmental conditions;

(c) provides real time data;

(d) provides the geographical position of the vessel, with a position error of less than 500 m with a confidence interval of 99%, the format being determined by the Flag State; and

(e) in addition to regular messages, provides special messages when the vessel enters or leaves the Convention Area and when it moves between one CCAMLR area, subarea or division within the Convention Area.

5. In the event of technical failure or other non-function of the VMS, the master or the owner of the fishing vessel, as a minimum:

(i) shall communicate at least once every 24 hours, starting from the time that this event was detected, the data referred in paragraph 4(i) by telex, by fax, by telephone message or by radio to the Flag State; and

(ii) shall take immediate steps to have the device repaired or replaced as soon as possible, and, in any event, within two months. If during that period the vessel returns to port it shall not be allowed to commence a further fishing trip without having the defective device repaired or replaced.

6. In the event that the VMS ceases to operate, the Contracting Party as soon as possible shall advise the Executive Secretary of the name of the vessel, the date, time and the location of the vessel when the VMS failed. The Party shall also inform the Executive Secretary when the VMS becomes operational again. The Executive Secretary shall make such information available to Contracting Parties upon request.

7. Contracting Parties shall report to the Secretariat before the start of the annual meeting of the Commission in 1999, on the VMS which has been introduced in accordance with paragraphs 1 and 2, including its technical details, and each year thereafter, on:

(i) any change in the VMS;

(ii) in accordance with paragraph XI of the CCAMLR System of Inspection, all cases where they have determined, with the assistance of the VMS that vessels of their flag had fished in the Convention Area in possible contravention of CCAMLR conservation measures.

1 Includes permitted

CONSERVATION MEASURE 170/XIX Catch Documentation Scheme for *Dissostichus* spp.

The Commission,

Concerned that illegal, unregulated and unreported (IUU) fishing for *Dissostichus* spp. in the Convention Area threatens serious depletion of populations of *Dissostichus* spp.,

Aware that IUU fishing involves significant by-catch of some Antarctic species, including endangered albatross,

Noting that IUU fishing is inconsistent with the objective of the Convention and undermines the effectiveness of CCAMLR conservation measures,

Underlining the responsibilities of Flag States to ensure that their vessels conduct their fishing activities in a responsible manner,

Mindful of the rights and obligations of Port States to promote the effectiveness of regional fishery conservation measures,

Aware that IUU fishing reflects the high value of, and resulting expansion in markets for and international trade in, *Dissostichus* spp.,

Recalling that Contracting Parties have agreed to introduce classification codes for *Dissostichus* spp. at a national level,

Recognising that the implementation of a Catch Documentation Scheme for *Dissostichus* spp. will provide the Commission with essential information necessary to provide the precautionary management objectives of the Convention,

Committed to take steps, consistent with international law, to identify the origins of *Dissostichus* spp. entering the markets of Contracting Parties and to determine whether *Dissostichus* spp. harvested in the Convention Area that is imported into their territories was caught in a manner consistent with CCAMLR conservation measures.

Wishing to reinforce the conservation measures already adopted by the Commission with respect to *Dissostichus* spp.,

Inviting non-Contracting Parties whose vessels fish for *Dissostichus* spp. to participate in the Catch Documentation Scheme for *Dissostichus* spp.,

hereby adopts the following conservation measure in accordance with Article IX of the Convention:

1. Each Contracting Party shall take steps to identify the origin of *Dissostichus* spp. imported into or exported from its territories and to determine whether *Dissostichus* spp. harvested in the Convention Area that is imported into or exported from its territories was caught in a manner consistent with CCAMLR conservation measures.

2. Each Contracting Party shall require that each master or authorised representative of its flag vessels authorised to engage in harvesting of *Dissostichus eleginoides* and/or *Dissostichus mawsoni* complete a *Dissostichus* catch document for the catch landed or transhipped on each occasion that it lands or tranships *Dissostichus* spp.

3. Each Contracting Party shall require that each landing of *Dissostichus* spp. at its ports and each transhipment of *Dissostichus* spp. to its vessels be accompanied by a completed *Dissostichus* catch document.

4. Each Contracting Party shall, in accordance with their laws and regulations, require that their flag vessels which intend to harvest *Dissostichus* spp., including on the high seas outside the Convention Area, are provided with specific authorisation to do so. Each Contracting Party shall provide *Dissostichus* catch document forms to each of its flag vessels authorised to harvest *Dissostichus* spp. and only to those vessels.

5. A non-Contracting Party seeking to cooperate with CCAMLR by participating in this Scheme may issue *Dissostichus* catch document forms to any of its flag vessels that intend to harvest *Dissostichus* spp.

6. The *Dissostichus* catch document shall include the following information:

(i) the name, address, telephone and fax numbers of the issuing authority;

(ii) the name, home port, national registry number, and call sign of the vessel and, if issued, its IMO/Lloyd's registration number;

(iii) the reference number of the licence or permit, whichever is applicable, that is issued to the vessel;

(iv) the weight of each *Dissostichus* species landed or transhipped by product type, and

(a) by CCAMLR statistical subarea or division if caught in the Convention Area; and/or

(b) by FAO statistical area, subarea or division if caught outside the Convention Area;

(v) the dates within which the catch was taken;

(vi) the date and the port at which the catch was landed or the date and the vessel, its flag and national registry number, to which the catch was transhipped; and

(vii) the name, address, telephone and fax numbers of the recipient(s) of the catch and the amount of each species and product type received.

7. Procedures for completing *Dissostichus* catch documents in respect of vessels are set forth in paragraphs A1 to A10 of Annex 170/A to this measure. The standard catch document is attached to the annex.

8. Each Contracting Party shall require that each shipment of *Dissostichus* spp. imported into its territory be accompanied by the export-validated *Dissostichus* catch document(s) and, where appropriate, validated re-export document(s) that account for all the *Dissostichus* spp. contained in the shipment.

9. An export-validated *Dissostichus* catch document issued in respect of a vessel is one that:

(i) includes all relevant information and signatures provided in accordance with paragraphs A1 to A11 of Annex 170/A to this measure; and

(ii) includes a signed and stamped certification by a responsible official of the exporting State of the accuracy of the information contained in the document.

10. Each Contracting Party shall ensure that its customs authorities or other appropriate officials request and examine the import documentation of each shipment of *Dissostichus* spp. imported into its territory to verify that it includes the export-validated *Dissostichus* catch document(s) and, where appropriate, validated re-export document(s) that account for all the *Dissostichus* spp. contained in the shipment. These officials may also examine the content of any shipment to verify the information contained in the catch document or documents.

11. If, as a result of an examination referred to in paragraph 10 above, a question arises regarding the information contained in a *Dissostichus* catch document or a re-export document the exporting State whose national authority validated the document(s) and, as appropriate, the Flag State whose vessel completed the document are called on to cooperate with the importing State with a view to resolving such question.

12. Each Contracting Party shall promptly provide by the most rapid electronic means copies to the CCAMLR Secretariat of all export-validated *Dissostichus* catch documents and, where relevant, validated re-export documents that it issued from and received into its territory and shall report annually to the Secretariat data, drawn from such documents, on the origin and amount of *Dissostichus* spp. exported from and imported into its territory.

13. Each Contracting Party, and any non-Contracting Party that issues *Dissostichus* catch documents in respect of its flag vessels in accordance with paragraph 5, shall inform the CCAMLR Secretariat of the national authority or authorities (including names, addresses, phone and fax numbers and email addresses) responsible for issuing and validating *Dissostichus* catch documents.

14. Notwithstanding the above, any Contracting Party may require additional verification of catch documents, including, inter alia, the use of VMS, in respect of catches by its flag vessels outside the Convention Area, when landed at and exported from its territory.

RESOLUTION 12/XVI Automated Satellite-Linked Vessel Monitoring Systems (VMSs)

The Commission,

Noting the extreme concern over the high levels of illegal, unregulated and unreported fishing for *Dissostichus eleginoides* and other marine living resources,

considers that:

1. Subject to paragraphs 2 and 3, members shall endeavour, by the end of the Comission meeting in 1998, to establish an automated vessel monitoring system (VMS) to monitor the position of its flag vessels licensed or permitted in accordance with Conservation Measure 119/XVI to harvest *Dissostichus* spp. or other marine living resources in the Convention Area for which catch limits, fishing seasons or area restrictions have been set by Conservation Measures adopted by the Commission.

2. Any Member not in a position to establish a VMS by the date specified in paragraph 1 shall so inform the CCAMLR Secretariat in advance of the 1998 annual meeting and, if possible, notify its intended alternative timetable for the implementation of a VMS.

3. The implementation of VMS on vessels while participating in the krill fishery is not currently necessary.

4. Once its VMS is established, each Member should monitor the position of its flag vessels vessels licensed or permitted in accordance with Conservation Measure 119/XVI. Should the VMS cease to transmit, the Member shall take immediate steps to ensure that the transmission is swiftly restored.

5. Members should report to the Secretariat before the start of the annual meeting of the Commission on:

   (i) any VMS in operation, including its technical details; and

   (ii) in accordance with paragraph XI of the System of Inspection, all cases where they have determined with the assistance of VMS that vessels of their flag had fished in the Convention Area in possible contravention of CCAMLR Conservation Measures.

1 For this purpose, VMS means a system where, *inter alia*:
   (i) information collected shall include the vessel identifier, location, date and time, which shall be collected with a required frequency to ensure that the Member cabn effectively monitor its vessel; and
   (ii) performance standards, at a minimum, include a system that:
      (a) is tamper proof;
      (b) is fully automatic and operational at all times regardless of environmental conditions;
      (c) provides real time data; and
      (d) provides latitude and longitude with a position accuracy of 500m or better, with the format to be determined by the Flag State.

RESOLUTION 13/XIX Flagging and Licensing of Non-Contracting Party Vessels

The Commission,

Concerned that illegal, unregulated and unreported (IUU) fishing in the Convention Area continues to persist,

Noting that IUU fishing is inconsistent with the objective of the Convention and undermines the effectiveness of CCAMLR conservation measures,

Recognising that the vast majority of the IUU fishing in the Convention Area is undertaken by fishing vessels flying the flag of non-Contracting Parties,

Inspired by the FAO Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas,

urges all Contracting Parties, consistent with their domestic legislation, to avoid flagging a non-Contracting Party vessel or licensing such a vessel to fish in waters under their fisheries jurisdiction, if that particular vessel has a history of engagement in IUU fishing in the Convention Area.

RESOLUTION 14/XIX Catch Documentation Scheme: Implementation by Acceding States and Non-Contracting Parties

The Commission,

Having considered reports on the implementation of the Catch Documentation Scheme for *Dissostichus* spp. established by Conservation Measure 170/XVIII,

Being satisfied that the Scheme has been successfully launched, and noting the improvements to the scheme made by Conservation Measure 170/XIX,

Conscious that the effectiveness of the Scheme depends also on implementation of the Scheme by those Contracting Parties which are not Members of the Commission ('Acceding States') but which fish for, or trade in, *Dissostichus* spp., as well as by non-Contracting Parties.

Concerned at the evidence that several acceding States and non-Contracting Parties which continue to be engaged in fishing for, or trading in, *Dissostichus* spp. are not implementing the Scheme,

Particularly concerned at the failure by such acceding States to implement the Scheme, to uphold and promote its objectives, and to meet their obligations under Article XXII to exert appropriate efforts with regard to activities contrary to the objectives of the Convention,

Determined to take all necessary measures, consistent with international law, to ensure that the effectiveness and credibility of the Scheme is not harmed by non-implementation of it by acceding States and non-Contracting Parties,

Acting pursuant to Article X of the Convention,

1. Urges all Acceding States and non-Contracting Parties not participating in the Catch Documentation Scheme which fish for, or trade in, *Dissostichus* spp. to implement the Scheme as soon as possible.

2. Requests to this end that the CCAMLR Secretariat convey this resolution to such Acceding States and non-Contracting Parties and give all possible advice and assistance to them.

3. Recommends that Members of the Commission make appropriate representations concerning this resolution to such Acceding States and non-Contracting Parties.

4. Reminds Members of the Commission of their obligation under the Catch Documentation Scheme to prevent trade in *Dissostichus* spp. in their territory, or by their flag vessels, with Acceding States or non-Contracting Parties when it is not carried out in compliance with the Scheme.

5. Decides to consider the matter again at the Twentieth Meeting of the Commission in 2001 with a view to taking such further measures as may be necessary.

RESOLUTION 15/XIX Use of Ports not Implementing the Catch Documentation Scheme for *Dissostichus* spp.

The Commission,
Noting that a number of Acceding States and non-Contracting Parties not participating in the Catch Documentation Scheme for *Dissostichus* spp., as set out in Conservation Measure 170/XIX, continue to in trade in *Dissostichus* spp.; and

Recognising that these Acceding States and non-Contracting Parties thus do not participate in the landing procedures for *Dissostichus* spp. accompanied by *Dissostichus* Catch Documents;

urges Contracting Parties,

1. Where they are unable to provide an authorised Flag State official(s) to monitor a landing for the purposes of validating *Dissostichus* Catch Documents, to discourage their flag vessels authorised to fish for *Dissostichus* spp. from using ports of Acceding States and non-Contracting Parties which are not implementing the Catch Document Scheme for *Dissostichus* spp.

2. To attach to the authorisation to fish a list of all Acceding States and non-Contracting Parties that are implementing the Catch Documentation Scheme.

RESOLUTION 16/XIX Application of VMS in the Catch Documentation Scheme

The Commission agreed that, on a voluntary basis, subject to their laws and regulations, Flag States participating in the Catch Documentation Scheme for *Dissostichus* spp. should ensure that their flag vessels authorised to fish for or tranship *Dissostichus* spp. on the high seas maintain an operational VMS, as defined in Conservation Measure 148/XVII, throughout the whole of the calendar year.[1]

1 This requirement does not extend to vessels of less than 19 m engaged in artisanal fisheries.

Appendix V: A Brief Description of the Main Species Exploited in the Southern Ocean[1]

Krill *(Euphausia superb)*

Distribution
Circum-Antarctic south of the Antarctic Polar Front, with centres of abundance in the Scotia Arc and some regions close to the continent in the Indian Ocean sector. Usually confined to the Antarctic surface water (0–100 m depth) in oceanic areas, krill has also been found close to the sea floor down to 350–400 m depth in shelf areas.

Size and Age
Krill grows to a maximum of 64 mm in length and may live for six to seven years.

Biology
Krill attain sexual maturity at two (females) and three (males) years of age. They spawn up to 10 000 eggs between December and March, with considerable interannual variation in timing. Recruitment success appears to be closely linked to the extent of pack-ice in the winter before and after spawning. In summer, krill preys on microscopic plankton, such as flagellates and diatoms, while in winter it feeds largely on ice algae from the undersurface of ice flows. Aggregations of krill can cover many square kilometres and may contain hundreds of thousands of tonnes of krill. Krill is the staple food of many baleen whales, seals, seabirds, fish and squid. Because of its position in the food web between the microscopic phytoplankton and the large vertebrate predators, and its abundance, krill is considered the key species in the Seasonal Pack-ice Zone and parts of the Ice-free and High-latitude Antarctic Zones.

Exploitation
Krill harvesting started in 1972/73 and peaked in 1981/82 (Figure 7). By the mid-1980s annual catches had stabilised at 350 000 to 400 000 tonnes, but they declined substantially at the beginning of the 1990s when countries of the former Soviet Union stopped fishing for krill. Annual krill catches are currently in the order of 90 000 to 100 000 tonnes.

Status
It is unlikely that the present level of fishing will have an adverse effect on the stock(s).

Marbled rockcod *(Notothenia rossii)*

Distribution
Marbled rockcod is a widely distributed species, found at the northern end of the Antarctic Peninsula, around the Scotia Arc, off Prince Edward, Crozet, Kerguelen, Heard, McDonald and Macquarie Islands, and on Ob and Lena Banks.

Size and Age
The species grows to a length of 85 to 92 cm and a weight of 8 to 10 kg. It can live for 15 to 20 years.

Biology
Three stages of the life cycle of this species have been distinguished: the fingerlings are pelagic for the first 6 to 12 months of their lives, after which they settle on the bottom in near-shore waters, often in kelp beds. They remain in shallow waters for four to six years. On reaching maturity at a length of 43 to 48 cm and an age of five to seven years, they migrate offshore to South Georgia was no longer viable after the end of the 1980s, although a low total allowable catch (TAC) was set to

[1] Reproduced from Kock, Karl-Hermann (ed), *Understanding CCAMLR's Approach to Management*, May 2000, http://www.ccamlr.org/English/e_pubs/e_app_to_manag/TEXT_final_.pdf, (site visited March 19, 2001).

reopen the fishery at a lower level (Figure 2). Currently, the species is exploited at South Georgia and Heard Island, and at the Kerguelen Islands only when a strong year class enters the fishery (Figure 5).

Status
The South Georgia stock recovered from three episodes of heavy exploitation in the mid-1970s and in the early and mid-1980s. However, stock size remained low after a fourth decline following the 1989/90 season. The stocks around the South Orkney and the South Shetland Islands are still only fractions of their sizes at the beginning of the fishery in 1977/78. The stock around the Kerguelen Islands supports a fishery only when a strong year class enters the fishery, and there is evidence that this stock has declined over the last decade. A low TAC has recently been set for the stock – probably never before commercially exploited – living on banks near Heard Island.

Grey rockcod *(Lepidonotothen squamifrons)*

Distribution
The grey rockcod has a circum-Antarctic distribution around the sub-Antarctic islands and seamounts that lie between them, such as the Ob and Lena Banks in the Indian Ocean sector. The species is found down to 800 m.

Size and Age
The maximum sizes observed were from 50 to 55 cm and the weights from 2,500 to 3,000 g. Fish may live as long as 16 to 20 years.

Biology
Although mostly found at the bottom, the grey rockcod feeds primarily on macrozooplankton, such as euphausiids, pelagic amphipods, jellyfish and salps. The fish becomes sexually mature at 28 to 36 cm (from 5 to 9 years old) at South Georgia and in the Kerguelen Islands. They spawn from October (Kerguelen, Crozet) to February (South Georgia). Fecundity varies from 58 000 to 196 000 eggs, depending on the size of the fish. Egg diameter is from 1.4 to 1.7 mm. The larvae hatch from the end of November.

Exploitation
This species has been exploited commercially, mainly off the Kerguelen Islands and on Ob and Lena Banks. At South Georgia, grey rockcod has been harvested only irregularly, and generally less than 1 000 tonnes per annum has been taken. In the Kerguelen Islands, grey rockcod was the third most important species (after marbled rockcod and mackerel icefish) for almost two decades of fishing (Figure 5). The fishery was closed by the French authorities at the beginning of the 1990s after it became evident that the stock was heavily depleted. The fishery on Ob and Lena Banks, where grey rockcod was the only target species, was closed by CCAMLR at the beginning of the 1990s for the same reason.

Status
Recent surveys suggest that the stock off the Kerguelen Islands is still at a low level; consequently, the fishery remains closed. The status of the two stocks on Ob and Lena Banks is unknown. In recent years, a low TAC was set to provide an incentive to reopen the fishery and to conduct a scientific survey to assess the status of the stock. This TAC was not taken and the fishery was closed again in 1997/98. The status of the stock around South Georgia is also unknown. Directed fishing for this stock is prohibited.

Patagonian toothfish *(Dissostichus eleginoides)*

Distribution
Patagonian toothfish is widely distributed, from the slope waters off Chile and Argentina south of 30 to 35°S, south of South Africa and south of New Zealand, to the islands and banks in sub-

Antarctic waters of the Atlantic and Indian Ocean sectors and Macquarie Island on the Indo–Pacific boundary of the Southern Ocean. Southernmost records of the species are for the South Orkney Islands and the South Sandwich Islands. It is found as deep as 2,500 to 3,000 m.

Size and Age
The maximum size and weight observed are, respectively, 238 cm and about 130 kg. Reliable age estimates for individuals larger than 100 to 120 cm are scarce. However, individuals close to the maximum size are likely to be from 40 to 50 years old or even older.

Biology
Patagonian toothfish feed on a variety of other fish, octopods, squid and crustaceans. They become sexually mature at 70 to 95 cm when they are 6 to 9 years old and spawn over the continental slope from June to September. The species' fecundity ranges from 48 000 to more than 500 000 eggs, varying with fish length and geographical locality. The eggs, which are from 4.3 to 4.7 mm in diameter, are generally found in the upper 500 m of the water column in waters from 2 200 to 4 400 m deep. They probably hatch in October–November.

Exploitation
Patagonian toothfish are being exploited by longline and bottom trawl both inside and outside the Convention Area where catches were first reported in 1976/77. Longline fishers targeted fish around South Georgia from 1985/86, with annual reported catches of 4 000 to 9 000 tonnes (Figure 2). Fishing was by Soviet longliners in the first few years, but is now mostly by Chilean and Argentinian vessels. Around the Kerguelen Islands, Patagonian toothfish has been targeted since 1984/85, first by the former USSR fleet (later Ukrainian) and later by French trawlers. In recent years, it has also been exploited by Ukrainian longliners. Annual reported catches in this region have been in the order of 1 000 to 9 000 tonnes (Figure 5). Since 1996/97, longlining for Patagonian toothfish has expanded rapidly into the slope waters of previously unfished islands, banks and seamounts in the Indian and Pacific Ocean sectors of the Southern Ocean. In spite of conservation measures implemented by CCAMLR, there is a considerable amount of unregulated and illegal fishing. In the 1996/97 season, estimated catches from unregulated and illegal fishing exceeded those from regulated fishing by a factor of at least five.

Antarctic toothfish *(Dissostichus mawsoni)*

Distribution
The geographical distribution of Antarctic toothfish is confined to the waters around the Antarctic continent with a northern limit at about 60°S. There are occasional records of this species from as far north as 57°S in the Atlantic and Indian Ocean sectors. Its bathymetric range extends to about 800 m.

Size and Age
The maximum size and weight observed are, respectively, 180 cm and about 75 kg. Individuals of 140 to 165 cm in length have been estimated to be from 22 to 30 years old.

Biology
Antarctic toothfish feed on a variety of other fish, octopods, squid and crustaceans. They are likely to become sexually mature at a similar length to Patagonian toothfish and probably spawn over the continental slope in August–September. The species' fecundity ranges from 470,000 to more than 1.3 million eggs, depending on the length of the fish.

Exploitation
Since 1996/97 Antarctic toothfish have become the target of a number of new and exploratory fisheries.

Status
The fishery is regulated by precautionary TACs imposed by CCAMLR for new and exploratory fisheries.

Patagonian rockcod *(Patagonotothen guntheri)*

Distribution
This species is found on the southern Argentine Patagonian shelf, and off the Falkland/Malvinas Islands and Shag Rocks. Single specimens have been found at South Georgia. It is most abundant in waters shallower than 250 m, but has been found at 350 m depth.

Size and age
The species attains a total length of 23 cm. The maximum age recorded is 6 years.

Biology
Patagonian rockcod is apparently benthopelagic, leaving the bottom to feed in the water column. At Shag Rocks this species generally preys on krill and, to a much lesser extent, the hyperiid amphipod *Themisto gaudichaudii*. It attains sexual maturity when 12 to 16 cm long. The egg size is 1.4 mm in diameter. Fecundity ranges from 6 000 to 23 000 eggs. In the Shag Rocks area, they spawn from September to October.

Exploitation
This species was exploited in the Shag Rocks area from 1978/79 to 1989/90. Because of the small size of the species, catches were mostly reduced to fish meal. The fishery was closed by CCAMLR after it became apparent that the stock was depleted.

Status
The current status of the stock is unknown. CCAMLR has prohibited directed fishing for this species.

Sub-Antarctic lanternfish *(Electrona carlsbergi)*

Distribution
This species has a circumpolar distribution between the Subtropical Convergence and the waters just south of the Antarctic Polar Front. Dense aggregations have been found around South Georgia and Shag Rocks. Sub-Antarctic lanternfish are found mostly in the upper 200 m of the water column, but at greater depths towards the Subtropical Convergence.

Size and Age
The maximum size and weight rarely exceed 10 cm and 14 g respectively. Fish live four to five years.

Biology
The main components of the diet are copepods, pelagic amphipods and euphausiids. Fish attain sexual maturity at 75 to 78 mm. Spawning is likely to take place between the sub-Antarctic and the Subtropical Frontal Zone in the austral summer–autumn. Egg diameter is from 0.7 to 0.8 mm. This species spawns several batches of eggs over the season. It is not known when the larvae hatch.

Exploitation
The Soviet Union began a trawl fishery for lanternfish (reported indiscriminately as *E. carlsbergi*) in the Antarctic Polar Front in the 1980s, with annual catches initially varying between 500 and 2,500 tonnes. Catches increased from 1987/88 by 14 000 to 23,000–29,000 tonnes in the two subsequent seasons, and peaked in 1990/91 (78 000 tonnes) and 1991/92 (51,000 tonnes) (Figure

2). The fishery lapsed in the 1992/93 season, as it was no longer considered to be economically viable.

Status
The status of the stock(s) is unknown. A TAC has been imposed by CCAMLR on the fishery in the South Georgia region (Statistical Subarea 48.3).

Humped rockcod *(Gobionotothen gibberifrons)*

Distribution
The geographic distribution of this species is confined to the Atlantic Ocean sector (northern part of the Antarctic Peninsula, islands of the Scotia Arc). Humped rockcod has been found down to 750 m, but is most abundant between 100 and 400 m depth.

Size and Age
This species may grow to 55 cm in length and 1,800 to 2,000 g in weight. At South Georgia, fish may live from 15 to 20 years.

Biology
Humped rockcod eat primarily benthic prey, such as tube worms, brittle stars, sea urchins and molluscs. The fish becomes sexually mature at 34 to 36 cm at South Georgia and at a slightly smaller size on the more southerly grounds. Spawning occurs at the end of the austral winter, but with latitudinal differences between stocks. Fecundity ranges between 21,000 and 130,000 eggs. Egg diameter is 2.0 to 2.5 mm. The larvae hatch in spring and early summer. Juveniles change from pelagic to benthic life at the end of the austral summer.

Exploitation
The first catches of this species were reported in 1976/77. Together with some icefish species, humped rockcod has been primarily a by-catch of the bottom trawl fishery targeting mackerel icefish. Only in some years, such as in 1977/78 at South Georgia, was this species targeted by the fishery, taking annual catches of more than 5 000 to 10 000 tonnes. The directed fishery on this species was closed by CCAMLR in 1989.

Status
There is evidence that the stock around South Georgia has partly recovered from depletion. The status of the stock near the South Orkney Islands is unknown. The stock around Elephant Island appears to have been little affected by fishing.

Wilson's icefish *(Chaenodraco wilsoni)*

Distribution
Wilson's icefish has a circum-Antarctic distribution, with northernmost records coming from the South Orkney and the South Shetland Islands. It is found down to 800 m depth.

Size and Age
Maximum size and weight observed are, respectively, 43 cm and about 700 g. Ages have not been estimated.

Biology
Wilson's icefish feeds primarily on krill, and to a lesser extent on fish. It becomes sexually mature at 23 cm and spawns in October–November, but its spawning grounds are unknown. Fecundity is 300 to 2 000 eggs in individuals of 30 to 32 cm in length. Egg diameter is from 4.4 to 4.9 mm. The larvae are likely to hatch in the austral autumn–early winter.

Exploitation
Polish and former East German trawlers reported catches of 10,100 tonnes and 4,300 tonnes respectively from Statistical Subarea 48.1 in 1978/79 and 1979/80, when concentrations of Wilson's icefish were detected north and northeast of Joinville Island at the tip of the Antarctic Peninsula (Figure 4). In the 1980s this species was taken regularly in an exploratory fishery of the Soviet Union off the coasts of the Antarctic continent. Depending on the ice conditions and the availability of fish aggregations, between 270 and 1,800 tonnes were caught each year. The fishery lapsed at the end of the 1980s when it was no longer considered to be economically viable.

Status
The status of the stock(s) is unknown.

Scotia Sea icefish *(Chaenocephalus aceratus)*

Distribution
The geographic distribution of this species is confined to the Atlantic Ocean sector (northern part of the Antarctic Peninsula, islands of the Scotia Arc, Bouvet Island). Scotia Sea icefish has been found down to 770 m, but is most abundant between 100 and 350 m depth.

Size and Age
Females attain 70 to 75 cm and up to 3,800 g, males attain 55 to 58 cm and 1,300 g. At South Georgia, they may live for 13 to 15 years.

Biology
Post-larvae and juveniles up to 30 cm in length feed primarily on pelagic and benthopelagic organisms, such as krill and mysids. Older juveniles and adult fish are bottom-dwelling and prey mostly on other fish. Males reach maturity at 35 to 45 cm and females at 45 to 55 cm. The species spawns from April to July in coastal waters. Fecundity ranges from 3,000 to 22,000 eggs. The diameter of ripe eggs is 4.4 to 4.7 mm. The larvae hatch between August and October.

Exploitation
Catches of the species have been reported since 1976/77. Scotia Sea icefish has primarily been a by-catch species in the bottom trawl fishery targeting mackerel icefish. Only occasionally, such as in 1977/78 at South Georgia, has the species been targeted by the fishery. Annual reported catches never exceeded a few thousand tonnes per statistical subarea. However, there is evidence that part of the by-catch in other fisheries was not reported. The fishery was closed by CCAMLR in 1989 when stock assessments indicated that some stocks had been depleted to below 50% of their sizes before exploitation.

Status
Research surveys suggest that the stocks around South Georgia and Elephant Island have largely recovered from depletion. The status of the stock near the South Orkney Islands is unknown.

South Georgia icefish *(Pseudochaenichthys georgianus)*

Distribution
South Georgia icefish is found off islands of the Scotia Arc and the northern part of the Antarctic Peninsula down to 475 m.

Size and Age
The species attains a length of 55 to 60 cm and a weight of 2,000 to 2,500 g. Specimens up to 15 years of age have been reported; however, age determinations differ widely between researchers.

Biology
South Georgia icefish feed almost exclusively on krill and fish. At South Georgia, they spawn in the austral autumn (March to May). Fecundity ranges from 5,000 to 11,000 eggs; the eggs are up to 4.8 mm in diameter. The larvae hatch between August and October.

Exploitation
The first catches were reported in 1976/77. The species has been a regular by-catch in the bottom trawl fishery, but has been targeted only in some years, such as 1977/78 at South Georgia and in 1979/80 in the South Orkney Islands. Annual reported catches exceeded a few thousand tonnes per statistical subarea in 1977/78. However, there is evidence that part of the by-catch in other fisheries was not reported. The fishery for this species was closed in 1989 after it became evident that the stocks at South Georgia and off the South Orkney Islands were depleted.

Status
The stock at South Georgia appears to have partly recovered from exploitation in the late 1970s–early 1980s. The status of the stock around the South Orkney Islands is unknown.

Stone crabs *(Paralomis spinosissima, P. formosa)*

Distribution
These species have been found at the South Orkney Islands, but appear to be most abundant in the South Georgia–Shag Rocks area. They are found at depths between about 100 m to more than 1,000 m.

Size and Age
Maximum carapace length is 122 mm in males and 112 mm in females of *P. spinosissima* and 102 mm in males of *P. formosa* at South Georgia. No age estimates have yet been made.

Biology
Information on the biology of the two species is limited to estimates of length at sexual maturity. Female *P. spinosissima* mature at 62 mm carapace length, male *P. spinosissima* at 66 mm (Shag Rocks) and 75 mm (South Georgia), and male *P. formosa* at 80 mm carapace length (South Georgia).

Exploitation
P. spinosissima was the main species in the experimental crab fishery in the Shag Rocks–South Georgia area between 1992/93 and 1995/96. The fishery used crab pots; all other bottom gear was prohibited. It was limited to sexually mature male crabs. A TAC of 1 600 tonnes per annum was imposed on the fishery. The one US fishing vessel that entered the fishery removed a total of 835 tonnes of crabs over three seasons (see section 1.2). The fishery was discontinued after the 1995/96 season because it was not viable.

Status
The impact fishing has had on the stocks is unknown.

Martialia hyadesi

Distribution
The squid *Martialia hyadesi* is a circum-Antarctic species whose distribution is linked to the Antarctic Polar Front. It appears to be particularly abundant in the southwest Atlantic Ocean sector, but is also found near the Kerguelen Islands and Macquarie Island.

Size and Age
The species attains a maximum mantle length of 50 cm. Its life span is probably two years.

Biology

M. hyadesi feed largely on mesopelagic fish, such as lanternfish. The species reproduces once during its lifetime. Its spawning areas are not known, but the catch of a few small juvenile specimens on the edge of the Patagonian shelf suggests there is some spawning there. This species is a large part of the squid diet of toothfish, southern elephant seals, grey-headed and black-browed albatrosses, and white-chinned petrels.

Exploitation

M. hyadesi are regularly caught in small quantities on the extreme eastern edge of the Patagonian shelf in the fishery for the squid *Illex argentinus*. In some years, when oceanographic conditions are favourable, it is present in much larger quantities in this fishery. About 26,000 tonnes were caught in 1995 on the Patagonian shelf edge to the northeast of the Falkland/Malvinas Islands. There is currently an exploratory fishery for *M. hyadesi* in Statistical Subarea 48.3 (South Georgia), where about 80 tonnes were caught in 1996/97.

Status

The status of the stock(s) is unknown.